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ENDOCRINE GLANDS *JUST ISSUED*

By P. Lereboullet: P. Harvier: H. Carrion: A. G: Guillaume. Translated by F. Raoul Mason, N. Y; with the collaboration of Daniel R. Ayres, M.D., N. Y.

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Medical Association Journal

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X-RAY AND CLINICAL FINDINGS IN NORMAL CHEST OF CHILDREN—6 TO 10 YEARS

NATIONAL TUBERCULOSIS ASSOCIATION MEDICAL RESEARCH

THE National Tuberculosis Association of the United States some time ago decided to appropriate $20,000 to further research work in problems related to its own field in the United States. One of the researches undertaken was an effort to establish the X-ray and clinical findings in the chest of a normal child up to ten years of age. For this problem the National Tuberculosis Association nominated the following groups of roentgenologists and clinicians. Dr. H. K. Pancoast and Dr. H. R. M. Landis of the University of Pennsylvania, Dr. F. H. Baetjer and Dr. C. R. Austrian of the University of Johns Hopkins, and Dr. H. K. Dunham and Dr. K. D. Blackfan of the University of Cincinnati. The signed reports of these physicians is here presented in two sections.

The X-Ray and Clinical Findings in the Normal Chest of the Child. Report of the Clinical Division of the Committee on Medical Research of the National Tuberculosis Association.

The value of Roentgenography in determining the presence of pulmonary disease has long been recognized. Studies to determine the roentgenograms of various pathological lesions of the lung have been almost without number, yet much difference of opinion exists in the interpretation of findings, largely because no satisfactory observations have been made establishing the variations that may occur in the normal. To one observer, shadows noted are indicative of disease; to another, they are not evidence of a pathological process; to one, they present lesions of clinical significance; to another, they suggest changes of no moment.

In the spring of 1920, that Committee called together the collaborators in this work and instructed them to set about in ways of their own choosing to solve the problem, extended to them a financial grant and in order that the problem might be a very definite one, asked that the immediate study be limited to a consideration of the chests of normal children between the ages of 6 and 10 years. The work was begun promptly and their final report is herewith presented.

Theoretically, the normal child is one of ideal height, weight and development for his age, without subjective or objective evidences of deformity or of disease and without residual changes due to antecedent pathological processes. Practically, a normal child is one of average height, weight and development for his age, symptom-free and without signs of disease, but as a result of residual changes that persist. An appreciation of these facts makes it apparent that the findings, clinical and roentgenographic, in normal children as we meet them will vary greatly from any fixed standards and still must be considered as variants of normal.

The clinical data dealt with in this report were obtained by careful examination of apparently healthy children between the ages of 6 and 10 years. All children who showed signs of disease were excluded from the series. Individuals from various strata of society, foreign and native born, residents of urban and of rural communities, school children and children residing in institutions, children exposed to tuberculosis and some without a history of such exposure, children with and without a history of previous infectious diseases, all symptom-free, and of an approximately

normal height and weight for their ages, were studied. A history of each individual was ecorded and in making the examinations of the chest, care was always observed to have the child relaxed and to see that no cramped or unnatural posture was assumed, for, as is well known, faulty position may lead to findings that cause confusion in interpretation. In addition, a tuberculin test was made on every child. The clinical data were then assembled and after the roentgenologist had interpreted his plate independently, the clinical and roentgenographic findings were correlated.

In all, over 500 children were thus studied and as a result some definite conclusions seem warranted.

As in the adult, so in the child vocal fremitus is more marked over the right upper chest than over the left.

It is generally stated that the percussion note elicited over the lungs of normal children within the age limits under consideration, is fuller, more tympanitic, of higher pitch and more resilient than that noted over those of adults, and that frequently the tympanitic quality is quite outspoken, especially over the lower lobe of the left lung. Although in general our observations confirmed this view, we have been impressed by the fact that in an appreciable number of such children, the note obtained on percussion over the lungs is indistinguishable in quality from that elicited over the lungs of normal adults and that the usual resilience of the note is lacking. These findings in many instances have an analogue in shadows noted in the X-ray films, shadows indicative of increased density along the bronchial tree, similar to those seen in the plates of normal adults. This correlation of the findings on physical examination and on X-ray study is more constantly possible in studies of the upper half of the chest. When minor changes, similar to those discovered by X-ray examination of the upper lobes, occur in the bases, they usually escape detection on physical examination. In those instances, in which no shadow is found to explain the deviation of the note from the generally accepted one, it is our belief that the lack of resilient quality may be due to a decreased elasticity of the chest wall.

The so-called tympanitic quality of the percussion note over the left base may be increased, decreased or be entirely lacking, depending upon the degree of distention of the stomach or colon, the curvature of the spine, and may likewise vary with the position of the diaphragm or with the posture of the child during the examination. The note over the upper thorax is often the same on the two sides. Kronig's isthmus averages 5 to 6.5 cm. in width. The lower margins of the lungs posteriorly are at the level of the 10th or 11th rib and descend from 1.5 to 3.5 cm. during forced inspiration.

A just detectible diminution of resonance over the apical regions is of no significance unless associated with a modification of the breath sounds in those areas or with other abnormal ausculatory findings.

It is generally accepted that normally in childhood, the breath sounds have a harsh, sharp character, with expiration longer and better heard than in the normal adult. This so-called puerile breathing is physiological and though it may seem trite, let it be emphasized that this exaggerated vesiculo-bronchial respiratory murmur, especially well heard in the areas overlying the great bronchi (*i.e.* anteriorly at the level of the first interspace and the second rib just lateral from the sternal margins, and posteriorly, particularly on the right side, at the level of the 2nd to the 4th spine) is often incorrectly interpreted as evidence of pulmonary disease. An ausculatory finding that has not been pointed out, or at least, has not been emphasized, has come forcibly to our attention in carrying out this study. Just as the full, deep note or higher pitch characteristically elicited by percussion of the child's chest is often replaced in health by a note more like that produced when one percusses the normal chest of an adult, so, on auscultation of a child's normal lungs, the exaggerated or puerile breath sounds may be lacking, and instead the so-called vesicular respiratory murmur characteristically present in adult life is heard. This finding, regarded by us as a physiological variation, has been noted as early as the age of four years and may perhaps occur in younger children. It is more readily appreciated and more often found than the variation in the percussion note just described. In more than 50% of the children in which this type of breathing was heard, examination with the X-ray gave findings like those obtained by a study of normal adult chests. In fact, the agreement of clinician and roentgenologist was so constant that we have come on the basis of these variations to designate the chest of normal children as of "puerile" or of "adult" type. The essential fact to be stressed is that so-called vesicu-

lar respiration is heard with great frequency in normal children, and is to be regarded as a variation of normal and not necessarily as an indication of disease.

These variations and those of the percussion note are more generally found in children with a history of infections of the respiratory tract. No satisfactory explanation for this finding is offered. It may be due in part to altered resilience of the chest wall, a suggestion supported by the fact that in some instances in which it was noted, diminished elasticity of the thoracic wall was apparent on percussion. It may stand in relation to variations of elasticity of the parenchyma of the lung. It may be due to a relative narrowing of the lumen of the bronchial tree. It is hardly to be considered evidence of increased density of respiratory tissue, for, theoretically, at least, that should lead to a modification towards bronchial breathing.

Concerning the whispered voice sounds, little comment needs to be made other than to emph size their loud transmission often with syllabation over the region of the major bronchi. Ausculation of these sounds over the upper thoracic spine of the children has led to the conclusion that D'Espine's sign as indicative of enlarged tracheo-bronchial lymph nodes is, to say the least, of doubtful value. In 23 of the children, this sign was elicited without other signs of a mediastinal mass and without any corroborativ evidence on X-ray examination. In 3, the sign could not be elicited, although from the X-ray plate it might have been inferred that it should be. Eustace-Smith's sign is so generally present in normal children that it is of little or no practical diagnostic worth. The presence of these two signs together with impairment of resonance in the interscapular region is all too frequently made the premises for a diagnosis of tuberculosis of tracheo-bronchial lymph nodes. This is unwarranted for, as indicated, these signs are unreliable evidence of a pathological condition and the determination of a diminution of resonance in the interscapular region requires such a nicety of technic that even masters of percussion disagree as to the presence or absence of significant findings in this region of the chest.

A year ago, in the preliminary communication to this Society, we stressed the importance of the rôle that antecedent infections might play in the production of areas of increased density within the respiratory tract. (Bronchial tree, parenchyma of the lungs, etc.) This fact is reemphasized, for further study has established the importance of it. Not only may recognized or remembered infections of the bronchi and lungs be responsible for alteration in these tissues, but other diseases not ordinarily considered of significance in this regard may be causal of such changes. For example, our observations indicate that after measles, pertussis or tonsillar infections, areas of increased density radiating from the hilum into the bases especially, occur with great frequency. Such lesions generally are not discovered on physical examination and would be unsuspected but for the use of the X-ray. They are referred to in the clinical part of our joint report in order to point out the need of a careful history as well as examination in all individuals, before proceeding finally to interpret the findings of the Roentgenologist. By way of digression, it may be interesting to point out the fact that though measles and pertussis have been known to produce lesions in the upper air passages, involvement of the lower tract has been considered a complication and was thought to occur only when evidence of bronchitis or of broncho-pneumonia were discovered. Our observations indicate that there may be a mild inflammatory process throughout the respiratory passages in a large percentage of the so-called uncomplicated cases of these diseases. This suggestion warrants further study in relation not only to the infections under consideration but also other infectious diseases. That such shadows, mediastinal and basal, noted in children who give a history of uncomplicated measles and pertussis are evidence of healed processes is evidenced by the experience that similar shadows of like origin have remained unchanged and without the development of clinical symptoms in a series of children observed from 3 to 5 years. Such changes must be properly evaluated as indices, not of present disease, but of lesions past and healed, not as warrant for the diagnosis of present illness and the institution of treatment, but as scars of infections met and overcome.

Most of the children included in this study were tested with tuberculin—some were given a cutaneous test with old tuberculin (Pirquet)—others were tested by the intracutaneous method. (Craig).

The foregoing facts have been detailed at some length to establish the major thesis that, clinically, the ideal, normal child is a hypothetical

impossibility. Children, apparently healthy, symptom-free and active, show on careful examination many deviations from fixed standards, variations that must be interpreted as within physiological limits; standards of height and weight must be elastic; measures of resonance and of resilience of the chest must not be rigid and estimates of acoustic phenomena must permit of a range of difference from the ideal. These facts, clinical experience establishes beyond peradventure, and they suggest a corollary, namely, that X-ray examination of the chest of such children may be expected to show comparable deviations from a fixed ideal roentgenogram.

The studies reported, fortified by past experience, warrant the following conclusions:

(1)—The data obtained on percussion and auscultation of the lungs of normal children show wide variations from a fixed standard. These variations are usual and are considered to be within normal limits.

(2)—Inasmuch as the changes referred to are dependent often upon alterations that persist as the residua of past infections of the respiratory tract, it is obvious that a careful anamnesis, with special reference to all infections, is necessary if diagnostic errors are to be avoided. Even a history carefully taken is often unreliable, as minimal infections are soon forgotten by many and among the unintelligent classes even more significant indispositions are not readily recalled

(3)—Failure properly to evaluate these deviations from a fixed standard will often lead to the unwarranted diagnosis of disease and to even less justifiable treatment.

(4)—With a proper appreciation of the widest variations that the normal may present from the ideal, the informed clinician is better able correctly to understand the findings of the Roentgenologist, and each, cooperating with the other, is less liable to error.

(5)—D'Espine's sign as indicative of enlarged tracheo-bronchial lymph nodes is of little value.

(6)—Recognition of and familiarity with the foregoing data is of cardinal and practical importance to every patient, potential and established. Without a proper appreciation of the facts set forth, no intelligent differentiation between a normal and an abnormal respiratory tract can be made.

In brief, to establish the presence or absence of disease, it is imperative that all data—clinical, laboratory and roentgenographic—must be evaluated and correlated and that no one fraction of the evidence be stressed to the exclusion of the others.—(*Signed*)—*C. R. Austrian; H. R. M. Landis; Kenneth D. Blackfan.*

The X-Ray and Clinical Findings in the Normal Chest of the Child Report of the X-Ray Division

It was soon realized by the X-ray members of the groups that an attempt to describe a normal chest was practically impossible. Their endeavours soon began to centre around the description of a theoretical normal with wide variations that would serve as a basis for the interpretation of abnormal appearances and tend to preclude the possibility of erroneous diagnoses being based upon faulty interpretations of hilum shadows, trunk shadows and linear markings more or less altered in appearance by the frequent respiratory infections of children. They realized that herein had existed the greatest source of error in interpretation, and no doubt the Association had this same thought in mind when the Committee was appointed to take up these investigations. Errors in interpretation have been made chiefly in connection with the diagnosis of pulmonary tuberculosis.

It was the consensus of opinion that children are probably more apt to show definite X-ray evidences in the hilum and trunk shadows of simple as well as serious respiratory infections than adults. Practically all children of the ages of those examined have had at one time or another one or more respiratory infections, especially measles and whooping cough, that are likely to produce very apparent changes in the shadows mentioned and which will remain distinctly visible for a variable period of time. These apparent deviations from the normal are not necessarily abnormal when observed, but may be the harmless results of one or more infections. No doubt such appearances have many times been misinterpreted as evidences of tuberculosis. In the conclusions reached by the Committee the attempt has been made to preclude this possibility.

Many of the general observations made have not been included in the conclusions. One of those perhaps worth mentioning is the fact that the heart of the child is found to extend relatively further to the right than in the adult.

The thoroughness with which the studies were carried out may be in part realized from the number of individuals examined. Over five hundred children were selected from all strata of life, as stated in the clinical report of the Committee.

The groups comprising the Committee met at the Phipps Institute, Philadelphia, March 3rd, 1922. Prior to this meeting there were misgivings as to the possibility of an agreement upon any very definite conclusions, but much to the satisfaction of all the members a definite agreement was reached and the conclusions were completed after a few hours careful deliberation.

To assist in a better understanding of the conclusions of the Committee, a composite diagrammatic reproduction of several roentgenograms was made and is shown in the accompanying illustration. It must be remembered that the three zones like the chest have thickness as well as length and breadth. Thus the zones extend anteriorly and posteriorly from the lung root as well as laterally.

Conclusions of the X-Ray Division of the Committee

The Normal Chest.—The normal chest of the child from the roentgenologic standpoint is subject to such wide variations within normal limits as to be beyond the possibility of exact description.

Hilum Shadow.—The conglomerate shadow commonly called the hilum shadow, when found lying entirely within the inner third or zone of the lung area can be disregarded, (or regarded as normal) except where it is made up of a solid mass of homogeneous shadow giving undoubted evidence that it represents a growth or mediastinal pleurisy.

Calcified Nodes.—Calcified nodes at the root of the lung, without evidence of lung disease, are of no significance except as a possible evidence of some healed inflammatory condition, possibly but not necessarily tuberculous. They are a common finding in normal chests.

Density and Thickness of Trunk Shadows.—In the normal lung the bronchial trunk shadows are not visible in the extreme apical regions. For convenience of descript on the remainder of the lung is divided into three vertical zones, extending outward from the lateral border of the spinal shadow to the lateral chest border.

The inner zone contains the root shadows.

The mid zone contains the trunk shadows, gradually fading out into their final subdivisions.

The peripheral zone contains radiating lines from these and fading off before the periphery is reached.

Where in the mid zone or peripheral zone, these shadows do not disappear in the characteristic fashion described, the appearance may be evidence of a variety of conditions, past or present, of an inflammatory nature or otherwise. It may accompany a tuberculous process but is not necessarily indicative of tuberculosis.

Improper or Misleading Terms.—The use of the terms "peribronchial tuberculosis" and "parenchyma tuberculosis" is not to be recommended in the interpretation of roentgenograms of the chest. Until corroborated by laboratory or clinical findings, the use of the terms "active" and "quiescent" should not be definitely applied to evident lesions demonstrated on plates.—

X-Ray Treatment of Throat Infections.—WITHERBEE considers that the treatment of focal infection for the throat by X-rays, as compared with surgical removal of tonsils and adenoids, gives more thorough and complete results, besides being safer and applicable to cases in which there may be contra-indication to operation. With the patient lying face downward and the head turned to the side, the position and angle of the patient and tube corresponding to that for radiographing the lower molars, about eight treatments to both sides, at two-weekly intervals, are given, using a 7-inch spark gap, five milliamperes, four minutes time, 10-inch distance, and 3 mm. of aluminium as filter. By this method the shrinkage of the tonsil and lymph tissue of the lateral and posterior walls of the throat produces a drainage of the crypts of the entire mucous membrane, and in 80 per cent. of diphtheria carriers so treated bacilli were removed in from two to four days. From an experience of nearly 500 cases so treated, Witherbee is of opinion that the method is free from serious complications, burns and injury to adjacent glands being impossible under proper technique. The shrinkage following treatment revealed two cases of abscess of the tonsil completely encapsuled by fibrous tissue. The method is specially indicated in chronically infected throats in vocalists, and in those cases associated with rheumatism.—*Brit. Med. Jour.*, May 13th, 1922.

SOME HOSPITALIZATION PROBLEMS—HOSPITAL STANDARDIZATION*

MALCOLM T. MACEACHERN, M.D., C.M.

General Superintendent, Vancouver General Hospital

THE subject as announced is far too large to be covered in the space of time allotted to me on the programme and, therefore, I will deal with one problem only, the most important one ever before our hospitals, and that is: "Hospital Standardization."

Before commencing let me tell you I most sincerely appreciate this privilege of having an opportunity of addressing a Provincial Medical Association on matters of most concern pertaining to the alleviation of suffering and to the eradication of disease, a service to humanity and one of the highest order. I realize that the Association I am addressing is a highly organized body standing for the advancement of medical science and practice. I congratulate you on your organization, your business methods and your splendid spirit of service for the betterment of community life in every phase. Indeed I am delighted to have an opportunity of laying before a well organized and powerful body of medical men, this very important question of hospital standardization, and I feel sure I can count in every way on your sympathetic support and cooperation.

You are assembled here for disinterested reasons for the improvement of yourselves in the best interests of the patient, for the advancement of medical science, for the rendering of a greater service to suffering humanity, in the combating of disease, for the making better of life, happier and more comfortable for all. It seems very fitting, therefore, that I should speak to you today on hospital service, realizing as we all must, that the hospitals are the doctors' workshops, from which is turned out the patient, as the product, in terms of health.

We have arrived at a time of perfecting organization in all activities of life. The day of communalism and cooperation is here, when men and women desire to work together to produce better results by cooperative effort. In all cases the results obtained depend on the kind of service rendered. Indeed, we must frequently take stock of ourselves in terms of service. The keynote of get-together meetings or conventions such as this, is service and better service. Corporations, hotels, railroads and other commercial organizations aim today at high-class service. I have just crossed the continent and had occasion to acquaint myself with the service on six different railroads and some five or six important hotels. I particularly noticed the efforts made to give their patrons service. Railroads today are catering to their patrons by supplying all their wants and comforts and as the traveller crosses the continent he sits in comfort and luxury enjoying almost all the privileges of life, so complete is the service now being given. If commercial and business organizations believe that in their success they must regard service as fundamental, how much more essential is it that hospitals must likewise so believe, dealing as they constantly do not with dollars and cents, but with human lives and life and death. Indeed, hospitals must regard service as the very ground on which they stake their right to exist.

The realization, therefore, of what real service is to sick humanity, is the fundamental doctrine of hospital standardization, as demonstrated today throughout this continent. It is the acid test and the crux of our claim to carry on in such important work as dealing with human lives. All must now realize that hospitals are indispensable factors in community life and must measure up to a service essential for the best interests of the patient.

In order to accomplish our task it is necessary to develop a better understanding between the medical profession and our hospitals and to foster a real cooperation and that sympathetic feeling conducive to a more constructive policy in our institutions known as hospitals, the aim being that the highest service possible may be brought to the patient. My task may not be easy, because I know there are many misunderstandings about hospitals which yet exist, both in the minds

*Address delivered before the Ontario Medical Association, Niagara Falls, Ont., June 1st, 1921.

of the profession and of the public; but, to know each other better is to work together better and to accomplish more. It is a most significant fact that the Ontario Medical Association and the Ontario Hospital Association should be meeting jointly this morning; indeed it is a good forecast, one that sees the Medical Association taking a more active and constructive interest in the hospitals of this province. Your Association, Mr. President, has already evidenced high worth and good calibre through your active organization and your profound interest in all matters of medical science and public health. I trust this power, this interest, this constructive ability will be so turned towards the hospitals in their reorganization and development as to render increasing and better service. This is especially needed now when the world is growing so commercialized, commercialized even to the extent of an inhuman economy, which makes us apt to forget the human side with its suffering, its failures and its wastage.

We hear today a great deal about conservation of such material things as forests, fisheries, furs, etc. We must hear more of conservation of health. One of Gladstone's most perpetuated utterances here applies: "In the health of the nation lies its strength." Health means national greatness, and surely the war records of "physical examination" of soldiers has banished all the conceit we had when it was found that fifty percent of our manhood was physically defective, and thirty-five percent of this was preventable. When we consider it in dollars and cents the annual national loss is appalling. I was greatly impressed by some statistics appearing in the 1917 report of the National Health Committee of the United States, and though these were compiled four years ago, I believe we are justified in considering that almost identical conditions exist today. This report states that about 3,300,000 people in Canada and the United States suffered from some form of illness during the year. Of these approximately 800,000 belonged to the industrial or producing class. These lost on the average about $700.00 per year, making a total of $560,000,000.00. Allowing for an equal amount of money to take care of them when ill, there would be a total loss of $1,120,000,000.00. One-half of this loss was found to be preventable, or $560,000,000.00. During the same period there were 1,650,000 deaths, of which forty percent were preventable, and estimating these at $6,000.00 each, the amount agreed upon by most statisticians, this would represent in monetary value an added loss of $3,960,000,000.00, thus making a total loss of $4,520,000,000.00. This does not take count of disabilities and expenses attached to care of dependents or of many other conditions. Why all this? Because we are not equipped and armed to fight and prevent the ravages of disease. What percentage of the medical profession take an active interest in the problems of public health and hospitals outside of their own circumscribed professional world? Very few indeed. We must organize a great national army of health; doctors, nurses and others, with good leadership, and hospitals and health institutions of all kinds from coast to coast of Canada, and these institutions must be so developed as to be worthy of the name hospital, because of the real service they give to each and every patient within their walls.

The practitioners of medicine in our hospitals must take stock of and put into working order the machinery required for better results. You say, we have advanced and have achieved,—that is quite true—but we have not overtaken our tasks; we are not yet obtaining the best possible results either in medical or hospital practice.

You, as a medical profession, have your problems, many of which do not concern me, but you, and I, as a hospital administrator, have much in common, and together, today we are discussing one of these. You, as a profession, must be interested in the question of public health in its broadest sense, a sense which includes all activities existing for keeping man healthy, prosperous and happy, a great economic problem to any nation. The hospital, with its equipment and personnel, holds an important strategic position on the battle front and is a tangible expression of the health of the community. The hospital must be an *effective* agency in the combating of disease. The war has proven to us that without such fully organized and equipped institutions we could not have carried on. Indeed, it is not reckless to say that the war was really won by the highly organized and developed medical, nursing and hospital services of the allies, for without soldiers physically fit, without disease prevention, without disease control and without the scientific and wonderful medical and surgical procedures, what would have happened our armies? The hospital, therefore, with its equipment, its personnel, holds a strategic position in the community and in the nation as a real factor in the fight against disease, besides having other and various functions, as for instance:—the training of doctors, nurses and attendants to recruit the great army of health, the

advancement of scientific and preventive medicine and scientific research and the spread of health education by precept and example. If your hospital and all it stands for is not the best institution in the community, then go back and make it so.

In the past hospitals have been regarded more or less as havens of convenience or as stopping places for the sick and to all intents and purposes as exercising the functions of a boarding house, with the addition of an antiseptic odor as carbolic, iodoform or ether. In fact, in many instances, the odors were the only indication of the nature of such institutions. It is unfortunate that some institutions like this still exist to-day, and it is only in the past year I have visited hospitals such as described which could not even be classified as good boarding or rooming houses; to-day these must be re-organized or put out of existence. The unsuspecting public expect you and me to assume the serious obligation of rectifying this in the best interests of humanity, and indeed they have confidence in our doing so.

The hospital has various duties to perform, and these extend to the patient, the doctor and the community. The hospital must provide a service to the patient in order that the doctor can apply his treatment most efficiently, for the mutual and fundamental objective is the return of the patient to health and happiness in the quickest and most comfortable manner, so that he or she may in the shortest time possible again become a producer adding to the national resources or assets of the country. Every sick person is a waste, a non-producer, a liability while being treated, and a loss to the state as a revenue producer. The hospital and the doctor, therefore, have a much interlocked obligation to fulfill, humane in its nature but yet one of patriotic and national character, a task pulsating with the ideal of service as a natural duty and an obligation we cannot and must not evade.

Hospitals are your workshops, your factories, and the product is health, the dividends are health and must pay one hundred percent returns. The hospital with the services and all connected therewith exists for the patient and the patient has the right to demand the highest quality of treatment and attention. The patient has the right to demand that every efficient means is provided for the arriving at a correct diagnosis, that every possible form of treatment, medical, surgical or special, be available, and that in every direction he receives everything necessary for his best interests.

The community expects all this and usually has such confidence in the hospital and its organization that they make no question. It is usually the public money which is spent, and it is given expecting a proper return. In some cases an imposing structure may inspire such confidence and pride in the community as to overshadow and obscure the poorest and most dangerous service. It is very easy to camouflage in our hospitals. The public must know what the hospital is doing for the money that is being spent, and what they should really expect. To this end hospital standardization will enlighten them and will, I believe, rectify conditions today existing and not in the best interests of the patient, the doctor, and the community.

In its application today hospital standardization establishes safe and competent treatment for the bringing back to health of the patient, if at all possible, in the quickest and most comfortable manner, and aims at the best obtainable results. It is a standard of service, sound, sensible and practical and it is within the reach of every institution to apply the same and to get results. When effectually carried out, hospital boards or trustees and officials can look their patients honestly in the face and say: "We have given you the best it is possible for us to give you;" and they can turn to the community which has liberally furnished them with money and answer: "We have discharged our duty efficiently and return you big dividends in health and lives for the money you have given us." Then and then only will the institution progress, and the patients and the public will have therein that confidence so necessary today.

The minimum standard as announced this continent over during the past few years and as carried to every hospital, to every hospital official, to every trustee or director and to the members of our medical profession, lays down a few definite clear-cut principles as a guidance to all hospitals desiring to measure up, to what they should, in the honest fulfillment of their obligations.

The first principle as laid down by this standard deals with the medical staff or the medical men attending the hospital and doing work therein. It asks that these men be organized into a definite staff or group for the specific purpose, particularly, of studying the work carried on within its walls, analyzing same, taking stock of it, finding out the successes and the failures, in short, carrying on a medical audit of the work done in the hospital. There is in all hospitals today a

careful financial audit at regular periods and how much more important is it that there should be an efficient medical audit on the work done in the hospital. All this work should be analyzed by the staff, whether it is good, bad or otherwise, and this too should be done at regular intervals. Analysis will lead to better results in the future by the honest consideration of successes and failures of the past. It is only reasonable to expect that results are not always up to our personal desires, and I know of no better way by which one can assist the other than by discussing the same in a meeting such as the above. This discussion must be done frankly, openly and constructively. If the number of men attending the hospital is not too large they can all attend the conference. I have seen such a conference carried on successfully when it was attended by eighty-seven doctors, with intensive interest kept up throughout, but I believe that more than this number might be somewhat cumbersome, and possibly grouping according to the different branches of work would be better. In some hospitals where there is a large number of attending men, the following grouping might be suggested: (a) Medical, including Neurology and Infectious diseases; (b) Surgical, including Gynaecology, Orthopedics, Genito-Urinary and Dermatology; (c) Obstetrics; (d) Eye, Ear, Nose and Throat; (e) Pediatrics. These groups can get together at least once a month to study, to review and to analyze the work of their respective departments. Certain conditions should be laid down at the commencement, Firstly,—that each man attend if at all possible. Secondly,—that each doctor is frank and honest in his statements. Thirdly,—that each doctor cast aside his prejudices and discuss all matters coming up with an open mind. Fourthly,—that constructive criticism be given and accepted by all taking part in the conference. In short, the ideal spirit of the whole meeting should be one of mutual assistance and cooperation—a study to benefit the doctor and to help the next patient under similar conditions. The cross-examination of each other should be keen and thorough and with the ultimate object in view of avoiding failures like those of the past and of transforming the present untoward results into future efficiencies. These meetings must not create antagonism but must result in even better *esprit de corps* amongst all medical men attending any hospital. It is very important that we meet and banish individual and group personal jealousies and antagonisms, especially in the smaller cities, towns and urban communities where this sometimes unfortunately exists. We must break all this down and keep in mind first and last the best interests of our patients.

The staff conference should review and investigate three main points; these are: (1) the casualties or deaths of the various services; (2) the infections occurring in the hospital; and (3) the unimproved patients. They may consider many other matters concerning the making more efficient of the hospital work, but the three points mentioned will be found to cover most of the ground. It may be desirable on some occasions to take a particular operation or disease and to make a six months or yearly summary on these cases with results; for instance: recently in a hospital which I know very well a very extensive report was compiled on all the goitre cases admitted during the year. This resumé showed conclusively that the death rate was too high and lead to the production of a very valuable report from the staff of the institution with certain well laid down rules and regulations to be followed by the different practitioners in the future. Therefore, as well as a review of the current or monthly work, it is also valuable to take up certain phases of the work spread over a longer period which will give more scope for comparative results. However, such a conference may find many matters to deal with, but primarily, they should take up the current work of the hospital in close review and ask themselves if they are obtaining the best possible results. A report of each conference with any recommendations deemed advisable should be handed in to the superintendent of the hospital after each meeting. The superintendent or one in authority will then take whatever action is deemed necessary or advisable. In such an arrangement not only does the patient profit but so does the doctor and the hospital very materially. The community, knowing that such is the case, will have more confidence in the work of the institution, for what they want is results.

Let me leave with you this thought in regard to the first requirement as laid down in the standard, and that is: that there be regular group study by the doctors attending each hospital, carried on in the form of a constructive medical review, by which all inefficient work, all incompetent or unnecessary surgery, will be checked up and prevented in the future, such a conference to be congenial and conducted in a mutual co-

operative spirit, giving the maximum result to all concerned.

In further relation to the medical staff, hospital standardization requests the ethical practice of medicine, just the same ethics that every doctor in securing his degree declared himself willing to live up to; all tendency to commercialism in the profession must be eliminated. Special stress is laid on the pernicious practice of fee-splitting Many are not clear on what this means but my interpretation is that such a practice consists in any procedure in medicine, and particularly surgery, that savors of a commission for services not rendered or of the exploitation of the patient for commercial gain. Surely a profession such as ours is above anything like this. It is the natural right of every patient to know what they are paying for and to whom they are paying their money. Every doctor is entitled to be paid for services rendered if the patient can afford it, but doctors sending their patients to surgeons who will pay them the highest commission or bonus for turning over their work, had better quit medicine and go into the business of buying and selling live stock, where they can carry on such a business honestly and legitimately; the doctor who peddles human lives to the lowest bidder surely is not worthy of a place in the ranks of the noblest group of men in the world. If such a condition exists it is up to you to put a stop to it and let every doctor who dares to darken the doors of a hospital, a sacred institution, be ethical and straight, carrying on his profession with a moral conscience which at all times stands for honest dealing with the patient, both socially and from a scientific or technical standpoint. To eliminate any suspicion of the so-called fee-splitting habit, one principle should always be observed, and that is: that the patient know to whom and for what he or she is paying the money. If this is carried out it will eliminate all secret division of fees.

The next requirement as laid down by hospital standardization deals with medical case records. The time is far past when patients can be treated and cared for without careful records being made thereof. Every hospital on our continent has the right to demand a record of every case treated therein. I do not think that any hospital has the right to exist today without keeping proper medical records. Much has been said, much has been written and unfortunately, it is too true, that much has yet to be done in this respect. It will be wasting your time for me to tell you what a medical record is or should be; suffice, then, to say it should not be a fairy tale, a novel or an excuse, but on the other hand, should be a clear, concise statement of fact and data and should embody a complete history, setting forth complaints, personal and family matters bearing on the case, how the illness commenced and developed and giving a complete examination of the different systems, especially the one affected: a record should represent an endeavour to ascertain the present condition, and should be a diary of the chief points of treatment and convalescence. It may be necessary to add special reports, such as x-ray, laboratory, operating room, etc. In addition, of course, there must be the nurse's portion,—the graphic temperature, pulse and respiration chart, medication sheet and nurse's notes, the latter being a careful record of all observations from minute to minute and made constantly while the patient is in the hospital. Such a record gives the doctor an intelligent and accurate knowledge of his patient so that he can far more effectually apply his treatment.

The advantages and uses of such records are many but I can only mention a few:

First—They are the basis for medical review and audit in the hospital, as I have already described. They are the medium through which stock-taking of the work can be carried on. They form the basis of any analysis when ascertaining how the hospital is carrying out its obligations, and spending its moneys.

Second—Medical records are most valuable as regards the patient, should he return to the hospital or be treated elsewhere.

Third—Medical records are useful beyond measure for furnishing correct data for the advancement of medical science.

Fourth—Medical records are of untold value medico-legally, when a hospital accepts suit as defendant in a court case.

Lastly—and perhaps most important of all, medical records make doctors take better care of their patients, for they imply routine examinations and when all this is in print there is a tendency to exercise greater care and attention in looking after the patient. The doctor benefits personally by gaining more scientific and systematized knowledge. The taking of the medical record inspires greater confidence on the part of the patient in the doctor, and eventually results in drawing to the doctor a larger and better clientele. I can instance many occasions which led to the doctor securing a greater number of patients by

this habit of thorough and systematically recorded examinations.

We must all be convinced beyond doubt that records are necessary and of untold advantage to the patient and doctor and are certainly worth while. The difficulty, however, arises in the securing of the same and especially in hospitals where there are few or no internes, as in open and non-teaching institutions. Doctors *must* see that proper records are kept on their patients. If internes are available it is up to the doctor to see that their cases are properly written up and supervised by them. Where there are no internes or not enough to carry on the full work the doctor must write the record himself. Unfortunately, practitioners do not like writing histories, making the excuse that they have not the time to do so. My answer to that is: that the man who has not time to write a complete record of his patient has not time to practise medicine. Medical men wrote their records in the army but some do not want to do it in private practice. I believe that the medical courses in our universities have failed to impress on the student the importance of case recording. This should be inculcated into our young medicos before leaving the college. However, there is no excuse for any doctor refusing to submit a good record on his patient. Every medical man practising in any hospital, whether that institution is public, private, special, closed or open, should see that a good record is obtained on each of his cases. Some hospitals furnish competent medical stenographers to take dictation and this is a splendid help, It is only fair that the hospital should supply some assistance, such as a record clerk, competent to take dictation and do the filing, cross-indexing, etc.

Internes today write all the public ward cases but there are in addition a large number of private and semi-private cases which are not secured, owing to the difficulties of approach. Records should and must be obtained on these cases, expecially by the attending doctor or by his assistant. Three choices may be given him: first,—write the record himself; second,— dictate it to a stenographer; third,—leave an order for an interne to do it. In my experience it is extremely difficult to get the average practitioner interested in this work at all. In some hospitals the senior resident or the assistant superintendent can secure the approach to private and semi-private cases, but it may be difficult for the interne. Before leaving this point let me express my wish that every doctor will seriously realize his obligation to the hospital in seeing that a record on his case is produced, either by himself or some delegated authority; further, to realize his obligation to the interne by teaching him to write reports and supervising his work generally. Hospitals are rightly insisting on medical records and are now feeling that they do not want any doctors to send cases in who do not realize the very great importance of having a good record of them properly filed away in the institution for further use and reference.

Finally, hospital standardization aims at placing at the disposal of the attending doctor and the patient all the facilities necessary to assist in making a complete diagnosis. This includes various forms of diagnostic facilities, such as the laboratory with all its branches, necessary to carry on the routine work of the hospital in this line, particularly pathology, bacteriology and clinical microscopy. There is a certain amount of fundamental laboratory work to be done in every hospital, no matter whether it is large or small. The larger the hospital the more elaborate the laboratory system can be developed. Standardization, however, is moderate in its demands and does not expect the elaborate system which is found in most large institutions today. It, however, demands the essentials, and facilities to assist the doctor in making or confirming his diagnosis. It is quite obvious to you all that every hospital should have a clinical laboratory to do the routine work such as urinalysis, blood and spinal fluid examinations, smears and other procedures, simple but of very great importance to the doctor and the patient. The more complicated diagnostic methods such as serological tests and blood chemistry have of necessity to be left to the larger laboratories which are now everywhere found. There are also other laboratories for diagnostic purposes, one of the most important of which today is the X-Ray, a valuable adjunct in diagnosis and more widely used each year. The X-Rays are becoming extremely useful and so essential in treatment that no hospital can afford to be without this department. In the larger hospitals other lines of investigation are found necessary, such as the Metabolism, Cardiographic studies, etc., and special treatment departments are existent as,—Physiotherapy with all its branches, and of recent years Radium. However, even many large hospitals do not supply all these facilities within their own organization, though are able to make use of them elsewhere. This is proper, as long

as the work is well done and entered in the records of the institution.

Granted that the hospital provides good accommodation and facilities for carrying on the work and an efficient staff, then there should be no excuse for bad work in the institution and the board of trustees can feel that they are playing fair with the patients and the community and that they are discharging their duties in the best interests of all concerned. When the conditions outlined above are complied with, the hospital is said to measure up to the minimum requirement as laid down by the standardization programme of the American College of Surgeons. This programme has been carefully constructed, has been tried and found successful, and today is offered to every hospital on our continent that wishes to accept it and live up to it.

This, therefore, is briefly, hospital standardization, which stands for a service to the unfortunate sick person. It is not a new thing, as a similar system was carried out during the war. It is well known to all that during the great war an efficient medical service was always provided, that medical case records could be produced for all patients, that there was a very careful scrutiny of the records and of the work through a careful medical audit. When one follows the course of the patient through the army medical organization we find in every instance an example of what we want in hospital standardization, that is:—everything that tended to the best interests of the patient carried out, so far as the applying of scientific skill the keeping of a careful record of all the work done, and the making of systematic reviews.

It is all very simple and does not imply much, if any, additional cost to the hospital—a small daily overhead will carry it. In our own hospital an elaborate record system costs approximately two cents per patient per day, but it is money well spent. At present we are giving a ten months course to graduate nurses that they shall become efficient in medical case recording, X-Ray and clinical laboratory technique. Such a person usually goes to a smaller hospital in our province or elsewhere, where she handles the three branches,—medical case records, laboratory and X-Ray technique. Usually she can take care of all three branches in a hospital up to one hundred beds. If fifty beds or less, she may be able to assume some of the nursing duties in the hospital. In fact, the standardization programme is so simple and practical that I see no reason why any hospital cannot adopt and carry it on. Though all this is clear, simple and generally admitted as sound in principle, yet there is some opposition or let me say apathy, on the part of our own profession; in fact it has been stated to me that it is an interference with their rights. It is to be regretted that such persons cannot realize it is in their own interests and will help immeasurably in their own practice generally. Some reputable doctors still treat it lightly, but these men must broaden their vision and get a new one on hospital service and practice. However, it is most gratifying to have the enthusiastic support of almost the entire profession of our country, in fact I believe that ninety-nine percent will enthusiastically endorse this programme. Further, we meet some apathy on the part of Boards of trustees who have not grasped the spirit of the movement. The public at large must know more about this programme and its scope so that they may fully appreciate it.

The success of the splendid movement amongst our hospitals of this continent can readily be realized by a glance at the figures obtained from the three surveys already made. During the past three years the American College of Surgeons have made three surveys of the 687 hospitals of one hundred beds and over in Canada and the United States. In 1918 there were 89 of these hospitals measuring up to the minimum standard requirement; in 1919, 198 had attained the requirement and last year, 1920, 407 met the standard. These results are most gratifying, and we are looking for greater returns in 1921. In Canada today every hospital of fifty beds and over is being reviewed.

Finally, ladies and gentlemen, let me urge you all to take a deep, intelligent and enthusiastic interest in this splendid constructive work now being done for our hospitals. Never before have these hospitals been presented with a better programme than that which is being carried to them and being so generally adopted, one which will be and is in the interests of all concerned. In this fair Province of Ontario I am hoping it will be received in an enthusiastic spirit at once by each of your hospitals, and for this year I am expecting great results.

THE EVOLUTION OF SURGERY AS I HAVE SEEN IT IN MY OWN PRACTICE

A. GROVES, M.D.

Fergus

WHEN Doctor Macdonald sent me an invitation to present a paper on the evolution of surgery as I have seen it in my own practice I felt very diffident about accepting it, lest the tenor of my remarks might take on the color and consistence of being merely personal, when in truth my intention is only to show the vast strides surgery has taken during the professional lifetime of one individual. A paper such as this can only touch a few of the advances. At the date of my graduation, 1871, Lister in Edinburgh was struggling to impress upon the surgical world the great truths of asepsis and antisepsis. His work is truly the dividing line between ancient and modern surgery and without it there could have been no evolution for asepsis is the root of modern surgery, without which evolution would have been impossible. There was at one time considerable discussion as to the merits of asepsis and antisepsis when really the only thing aimed at was asepsis, and antisepsis was one of the means by which it was achieved. Up to that time, and for years afterward pus formation was looked upon as the usual and almost inevitable accompaniment of a wound. it was expected by the surgeon and he was rarely disappointed It did not occur to the surgeon's mind that pus arose from any error of technique but rather that it was something to be desired for he spoke of healthy pus and laudable or praiseworthy pus. If there was soreness or redness in a wound the formation of pus was encouraged by the application of that unscientific and unhygienic thing—a poultice. This kept out light and air and supplied heat and moisture, the four requisites for germ growth. It was in other words an almost perfect culture medium. When the pus poured out the fact was accepted as undeniable proof of the correctness of the treatment. The first step in getting away from the poultice was the wet dressing which was probably less injurious but healing could not go on normally in the abnormal condition o a sodden wound, so that in a short time the conclusion forced itself upon me that rest, air, sunlight and dryness were four great requisites in treating uninfected wounds to which, for infected wounds, should be added the removal of dead matter, and drainage. The practice of using dry dressings I began almost at the beginning of my work because it did not seem rational to expect normal repair under abnormal conditions and when I observed that wounds which were kept dry healed better than those with wet dressings I discarded the latter. At that time, and even since, it was claimed that antiseptic lotions destroyed the germs present but the fact was overlooked that the only germs destroyed were those on the surface where they did no harm and would die if moisture was not supplied, and that the germs doing all the damage were those within the tissue beyond the reach of any lotion. Even the method of irrigating infected wounds by means of multiple tubes with or without antiseptics is in the last analysis nothing more than thorough drainage, the fluid keeping the spaces open and carrying away decomposing tissue. Normal saline is probably the best solution to use but it should be discontinued as soon as the wound is clean in order to allow normal repair to go on. In those days the abdomen was surgically as well as anatomically almost a closed cavity. A few of the more daring spirits took out ovarian tumors but beyond that nothing was attempted. Even in the case of ovarian cysts it was the practise to wait until the growth was large and the patient's life was in danger before an operation was advised. Appendectomy, hysterectomy, prostatectomy, gall-bladder operations, splenectomies, anastomoses and all the many intra-abdominal operations of today were totally unheard of. I recollect the lecturer on anatomy in 1869 telling us, in describing the appendix vermiformis that it was an organ that was unimportant "because, it had no uses and no diseases." At that time a patient with acute appendicitis was said to have "Idiopathic peritonitis" and chronic cases were diagnosed as biliousness or indigestion; it is too often done yet, ignoring the fact that these are not diseases but results of dis-

ease. Even then there were those who dreamt dreams and saw visions; of such was Dr. James Bovell, Lecturer on Physiology in Toronto School of Medicine, who in one of his lectures told us that in his opinion the day was near at hand when the abdominal cavity would be opened as a matter of routine for diagnostic purposes. Looking back today I recognize him as one of the prophets, and that saying of his never faded from before my eyes although at the moment its fulfillment seemed impossible.

My early operative work was done under rather primitive conditions. The operating room was generally the kitchen, there being no other room large enough, and either a couple of boards were laid on trestles, or the kitchen table was used as an operating table. Milk dishes were used for basins, for wiping, sea-sponges were used, horse hair was taken directly from the horse's tail, generally the doctor's horse, If the operation had to be done at night a coal oil lamp supplied the light. Chloroform was the one anesthetic. It was dropped from the bottle with a split cork, the inhaler being a towel. For general use the method has not been improved upon. Ether may be safer but I have never seen a death under chloroform, and I gave it exclusively for more than thirty years. Sterile gauze and absorbent, sterile ligatures and all the refinements of modern practise were unknown. The trained nurse, the most valuable ally of the surgeon, had not yet arrived. My first major operation done July 5th, 1873, was the removal of an ovarian tumor and in those days the success of the operation was supposed to depend largely on the length of the incision and the treatment of the pedicle. Some operators advocated short incisions and some long, not realizing the truth that the incision should be fitted to the case, not the case to the incision. Some tied the pedicle and dropped it back into the abdomen, leaving the end of the ligature out, others fixed it in the abdominal wall either by stitching it to the parietes or by a clamp lying across the wound. The profession searching eagerly for truth had its attention fixed on non-essentials when the great light of asepsis opened their eyes and made all things possible.

Not having seen the abdomen opened I was anxious about many things and while strenuously thinking the matter over I remembered that typhoid fever germs could be present in running water, the drinking of which would produce the disease. That being so I decided to boil the water used in connection with the operation lest there should be germs of some kind in it, and I also boiled the instruments and everything coming in contact with the wound. The case recovered without pus formation and I continued the practice of boiling everything in all my work. In putting the abdominal wound together I used needles in a way similar to the old hare lip operation, the needles being passed through the whole thickness of the abdominal wall and wound around with thread. After the patient began going about, a large post-operative hernia developed and a similar result having followed my second case I considered exhaustively why it was. I concluded at last that it arose from defective technique. If the skin healed perfectly when its edges were brought together I could see no reason why the underlying tissues would not do the same thing if they were brought together anatomically each to each. As I set forth in a paper published in 1904 it appeared to me that muscles were for active work and fascia for passive resistance and that my post-operative hernias were a result of fascial incompetence owing to my failure to bring the edges of the cut fascia together. At my next next abdominal operation, in 1874, I stitched each layer together separately and was no more troubled with post-operative hernia. Needles and other methods of through and through suturing were discarded. So far as I know this was the first case where the principle of anatomical apposition of wounds was recognized and applied. At this time the treatment of congenital and acquired hernias consisted mainly in the application of trusses, the injection of irritants into the canal in inguinal hernias whereby it was hoped to set up adhesive inflammation and so close the canal and lastly the invagination of scrotal tissues to act as a plug but the treatment was usually a failure. The recognition of the fact that hernia is always the result of fascial insufficiency opened the way to its rational treatment. The solution of the problem of the radical cure of a hernia consists simply in putting all the tissues in the position they occupy in a normal individual, the important structures being the peritoneum and fascia. Once this principle was recognized hernia became a curable condition. An analogous state of affairs existed regarding perineal lacerations. In the early days the torn parts were denuded of mucous membrane and scar tissue and the raw surfaces stitched together producing an appearance of cure and nothing more. The condition was really worse than before operation for mucous membrane which was normally required had been

dissected off and thrown away. It was evident to me that to restore the perineum it must be done anatomically, that is fascia must be joined to fascia, muscle to muscle, skin to skin, mucous membrane to mucous membrane. There was no redundant tissue to throw away. The basic idea in this as in all restorations or repairs being to bring the parts back to their normal arrangement and condition. The first time I did what I called anatomical perineal repair was in 1875, and the patient was confined two years afterwards, without the occurrence of rupture. In the repair of hare lip where there always is a deficiency of tissue the method laid down in the books even yet is to pare the edges of the cleft and so sacrifice tissue where there is already too little. The method I have used for more than thirty years is to make two flaps at the angles of the cleft, turning them down and then to make an incision on each side of the cleft at the junction of the skin and mucous membrane. These incisions are carried two-thirds of the way through the lip. The flaps are stitched together and then stitches are passed through two-thirds of the thickness of the lip, and tied; instead of stitches, hare-lip pins may be used, and my results appear to be better with them, finally the two angular flaps are stitched together. The perpendicular flaps make the lip of normal thickness and the angular flaps do away entirely with the disfiguring notch. I never sacrifice tissue in repair work if it can possibly be avoided.

The advances that have taken place in my time in operating for stone in the bladder are worth noting in a rapid review such as this. The cutting operation selected was almost always by the perineum and although the supra-pubic method was mentioned it was not approved of. My first case of stone in the bladder was in a man of 63, weighing over two hundred pounds, and a hard drinker. Surgeons of the highest standing had refused to operate thinking only of the perineal route. When he came under my care I decided on a supra-pubic lithotomy which I did April 20th, 1878, removing six calculi, and the patient promptly recovered. This operation was done in the bedroom in an old hotel with two students as assistants. There was no hospital nearer than Toronto and medical men were averse to countenancing unorthodox surgery. Within a short time I operated on three others in the same way (one being a boy of seven) and with similar results, and I became convinced that if the subra-pubic route was to be preferred in the most difficult cases it ought also to be best in simple ones. These four cases were referred to most approvingly in the American Encyclopedia of Surgery published in 1884. So far as I am aware these were the first supra-pubic operations done in Canada; the operation had been done about 1720 by Franco and by John Douglas and subsequently by various operators, but it was as yet practically almost unknown. The fact once established, that the bladder could be safely opened supra-pubically, meant that vesical tumors and diseases could be intelligently dealt with and was the basis of all modern vesical surgery. In connection with stone it might be of interest to compare the stone crushing operation of fifty years ago with the litholopaxy of today. Up to 1878 lithotrity consisted in repeated crushings, each of a few minutes duration, followed by severe reaction supposed to be caused by the operation, but in reality the result of broken fragments left in the bladder after an incomplete operation. Bigelow's evacuator by means of which the bladder is emptied at one operation changed the whole outlook of lithotrity. With single stones of small or medium size I have found it the operation of choice. I have not had a failure or a fatality and when we consider that there is practically no suffering and no long and painful convalescence I believe it, rather than lithotomy, should be done in suitable cases.

My first appendix operation was done in 1883, and fortunately was upon a very simple case for I was without experience of much value. Before this time I had begun to devote a good deal of attention to cleaning the skin at the site of operation, using soap and water with thorough brushing. To get my hands clean I used six brushes that had been boiled and washed my hands never less than half an hour with water that had been boiled. I had learned and applied the great principle underlying the command "to wash and be clean," and I have never had better results than when I followed that simple formula.

When iodine and other antiseptics came into use for skin disinfection I used them but did not give up my faith in washing.

In cases of encysted appendiceal abscess, where it is possible to open them without opening the general peritoneal cavity, I do so, but I don't take out the appendix, as by so doing the peritoneal cavity would probably be opened, adding greatly to the danger. I believe I have never lost a case of this kind. In these cases I always advise that the appendix should be taken out after complete healing has taken place. It does not appear to be

good surgery to leave in the abdomen an appendix or any other organ known to be seriously diseased when its removal is not dangerous. I have known many cases of recurrent abscess, and when abscess does not recur there is the usual train of symptoms common to chronic appendicitis with all its dangers. The teaching that secondary abscess rarely occurs appears to me most erroneous. I have operated on more than fifty cases of recurrence, one being a child who had three recurrences before it was two years old. The idea that the appendix in such cases is destroyed or obliterated by inflammation is without foundation. I have never operated on such a case without finding the appendix and if I had failed to find it I would attribute the failure to my inability to do so, not to its absence. Every diseased appendix should be operated on at the earliest possible moment. An interval operation is fairly safe if one could be sure that there would be an interval, but he who does nothing hoping for an interval will lose many cases. The more acute the case the greater the need of immediate operation. In my opinion the so-called treatment by starvation and by enemata is far worse than useless, it is keeping up a pretence of treatment when nothing is being done in the very face of death. An appendicitis can neither be killed by starvation nor drowned by an enema syringe. Where an abscess has burst into the abdominal cavity I remove the appendix and wash out the pus by means of an irrigating tube using normal saline solution at a temperature about 110 degrees. To try to wipe out pus with a sponge is as hopeless as it would be to try to get the pus off one's hands by wiping with an infected cloth, besides wiping abrades the delicate peritoneal surface causing adhesions. Knowingly to leave pus or any other free foreign substance in the abdomen appears to be indefensible, especially when it is easily gotten out, and when the patient's condition will improve during the process. It has been said that irrigation will scatter the pus but to scatter it it must be moveable, and if moveable, move it out. To scatter it and leave it would be wrong. But why leave it?

Where an abdomen contains pus, if the condition has not lasted more than twelve hours there ought, judging by my own experience, to be recovery if thorough irrigation is done with warm normal saline. I seldom use more than five gallons, but my rule is not a certain quantity but a quantity sufficient to clean out the abdomen. When I began this treatment I occasionally lost cases because I failed in thoroughness but since I learned to do the washing properly I have had a series of ninety six cases of pus in the abdomen operated on within twelve hours from the time of rupture without a death. I do not follow the practice of putting in multiple drainage or placing the patient in Fowler's position because I leave no septic fluid in the cavity. The Fowler position is simply a method of attempting to drain septic fluid from one part of the abdominal cavity to another. If fluid will change its position of itself —then it should be washed out. The use of Fowler's position and the leaving in of multiple drains would be proof that I knew I had left removable septic fluid in the abdomen. Multiple drainage is properly used in a septic wound which can not be cleaned, but the abdominal cavity is not a wound and can be cleaned. Drainage of the general peritoneal cavity is impossible as can be easily demonstrated. Every drain inserted becomes walled off by adhesions in a very short time, and is a sinus that does not communicate with the general cavity. My observations have convinced me that a large proportion of so-called bilious attacks and indigestion are but the results of appendiceal disease. An acute attack of appendicitis occurs only in a previously diseased appendix and the condition should be diagnosed and the appendix removed before the acute attack occurs. This, not interval operations should be the ideal aimed at, and when it is realized by the profession and taught to the public that bilious attacks, indigestion, cramps in the abdomen, etc., are not diseases but only the results of disease, usually of the appendix, and that immediate operation is the only treatment then acute appendicitis and ruptured appendices will not be heard of any more. In almost every direction evolution has been going on rapidly. I shall refer only to methods of reducing hip joint dislocations.

In spite of the great advance made when the Bigelow method of scientific manipulation was substituted for the more or less blind force of the compound pulleys the practitioner usually feels considerable anxiety when called upon to reduce a dislocation of the hip. The manipulations vary for every form of dislocation, the movements to effect reduction must be in proper sequence and their direction must be changed at the proper moment otherwise failure will result. And even when everything appears to have been done properly the bone fails to go back into its place and the whole process is repeated with variations, the soft parts being more or less lacerated with

each attempt. Indeed it has been recommended to tear the obturator internus in two in order to facilitate reduction. Having known men of ability fail after persistent effort it struck me that a method might be devised which would be simple in execution and positive in result. In looking at the os innominatum and the upper part of the femur in their normal position, the appearance is that of a somewhat flattened cone or pyramid, the head of the femur being the apex. When dislocation occurs, the head of the bone, that is the apex of the pyramid, slips down to the base and the problem of reduction is simply to replace it. It will be observed that in whatever direction the bone is displaced there is an open tunnel extending from the acetabulum to the head of the bone, and this tunnel through the soft parts, is kept open and straight, by the head and neck of the femur. To replace the femoral head is then an engineering problem and an engineer would solve it by following the line of least resistance, that is he would bring the head back through the tunnel it made in escaping. To do this I devised the following method.

The patient is placed on the mattress on the floor lying on the uninjured side. An anesthetic is given until complete muscular relaxation is obtained; an assistant stands behind the patient in a stooping position, having a roller towel over his shoulder and under the patient's thigh close to the perineum. He places both hands on the crest of the ilium to steady the pelvis. The surgeon grasps the patient's knee with one hand and his ankle with the other, flexing the thigh at right angles to the body and the leg at right angles to the thigh. The assistant now presses firmly down on the pelvis with his hands and at the same time makes slow steady traction by means of the towel, the pull on the head of the femur being in the direction of a straight line produced upward through the two acetabula. The surgeon holding the knee uses the femur as a lever having the towel for a fulcrum and he controls accurately the movements of the head as it is drawn back to its place. It does not matter in what direction dislocation has taken place, the principles are the same, that is—traction upward in a direct line to bring back the head of the bone through the tunnel it made. By this method the surgeon does no additional injury to the soft parts, he tears no muscles, he never hooks the sciatic nerve around the neck of the bone, he never accidentally changes one dislocation into another—he always succeeds in reducing a recent dislocation. The method combine—simplicity, safety and certainty.

TYPHOID FEVER IN INFANCY AND CHILDHOOD*

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THIS paper is based upon an analysis of fifty cases of typhoid fever occurring in the wards of the Children's Memorial Hospital, Montreal, from the years 1911 to 1922 inclusive. The cases were clinically unmistakably typhoid fever or were proven to be such by positive blood culture or positive Widal re-action.

It is only within the last sixty years that clinicians have agreed that typhoid fever occurs in the child. A great many figures are now available which prove that it not only occurs but that it is by no means rare. (1) Dr. A. D. Blackader of Montreal has reported 100 and (2) Montmollin 295 cases of typhoid fever in patients under fifteen years of age. A great many authorities still regard typhoid fever as rare under five years and very rare under two years of age. In Montmollin's 295 cases there were 15 under two years, and in 406 cases of all ages reported by (3) Schoon, 68 cases were under five years of age. In Blackader's series 4 were under two years and 13 between two and five years of age. The figures given above, largely based upon hospital practice,

*An analysis of fifty cases occurring in the wards of the Children's Memorial Hospital, Montreal, Canada.

give some idea of the frequency of typhoid fever in children but we feel that it is probably much more common than these figures would lead us to believe. In forming an opinion in regard to the incidence of this disease in children one must bear in mind that only the severe cases are sent to hospitals and that parents, will not, as a rule, send a child to the hospital nearly as readily as an adult, and fortunately ill children are more easily cared for at home than are adults.

The occurrence of typhoid fever in more than one member of the same family at the same time is well recognized. Our last six cases developed during a very interesting local epidemic, in one section of the city and was somewhat unusual in the way it struck down whole families at the same time, pointing to a food borne infection. The children seemed to be especially affected. In our cases four were from one family with three adults ill at home. The other two were brother and sister and their younger sister was ill at home. Several other similar cases were reported to us.

The occurrence of more than one case in the same family is not at all uncommon. In our series we had four children from one family, three from another, five from a third, and seven where one or both parents were in one of our general hospitals with typhoid fever.

The failure to recognize typhoid fever, in some cases, in children is probably due to the indefinite and uncharacteristic onset of this disease, the short and comparatively mild course which is seen especially in younger patients, the frequency of acute and severe intestinal upsets and diarrhoeas in childhood, and the general lack of the application of laboratory methods to patients outside well organized and equipped hospitals. The introduction of laboratory methods in the study of typhoid fever, especially blood cultures, the Widal re-action. and the bacteriological examination of the excreta has placed the diagnosis on a firm basis and has shown a larger incidence of this disease in children than was previously recognized.

It is convenient to consider typhoid fever in young persons under the following headings: The foetal type, infantile type, the type seen in early childhood and that in late childhood.

Foetal Type—(4) Morse of Boston has shown that typhoid fever occurs in the foetus. The disease is a septicaemia without involvement of the intestines, probably due to the fact that this organ is inactive. The foetus is infected from the maternal blood through the placenta. The result of this invasion by typhoid bacilli is foetal death and abortion, or a child born suffering from typhoid fever with subsequent death. A recovery has apparently not been reported.

Infantile Type—This includes all cases under two years of age. (5) Holt in his text-book, edition 1904, said he had never seen a clinical case of typhoid fever in a child under two years of age, not had he ever seen a post mortem on such a case. In the latest edition of his text-book, (6) however, he reported 11 cases under two years of age. Cases proven at autopsies are reported by (7) Ogle at four and one half months, and by Murchison at six months. In the 295 cases reported by Montmollin, 15 of them fall within this group. The majority of cases reported in this group have occurred during epidemics. It is interesting to note how relatively few children were affected in the Montclair epidemic in 1894. Of the 115 cases only 3 were under two years of age. In our series of cases two belonged to this group. The most striking features are the height and irregularity of the fever. Diarrhoea, tympanites and vomiting are more commonly seen than in later childhood. When associated with diarrhoea cases of typhoid fever in infancy are frequently considered to be cases of severe enteritis. One of our cases illustrates this point very well. One of the nursing staff was taken ill with typhoid fever and a search for the source of infection began. It was found that in the case of a female infant 9 months of age, admitted for and treated as a case of simple diarrhoea, the mother was in the Montreal General Hospital with typhoid fever. The child was then convalescent. A Widal was done and was positive. There were no rose spots and the spleen was never palpated. Had the nurse escaped infection this case probably would have passed unrecognized. Our other case was a boy one and one half years of age who, with his brother two and one half years old, were taken ill at the same time, entered the hospital on the same day, ran the same general course and went home together. Each had a period of continuous fever, with an average of 101° to 102° up to the 21st day. They both had abdominal distention and diarrhoea. There were no rose spots but the spleen was palpable. They both were drowsy and irritable during the febrile stage. Each had a positive Widal.

Early Childhood—This group includes cases from two to five years of age. There are still many who regard typhoid fever as rare during this period of life. Blackader's figures show 13 in this group of his 100 cases under fifteen years of age.

In our series 17 of the 50 cases were under six years of age. As a rule this group shows the mildest cases. There is a minimum of intestinal symptoms and a predominance of nervous manifestations, varying from apathy and irritability to acute delirium. Our cases showed the features described with the exception of a shorter course of fever than is generally seen. Almost all had temperatures for over 3 weeks. Severe cases may have an onset resembling meningitis.

Later Childhood—This group includes cases from five to twelve years of age. With increasing age there is a gradual transition to the adult type which is seen as a rule after the age of twelve years.

The general picture of typhoid fever in infancy and childhood resembles at its onset very much the adult type. General malaise, anorexia and vomiting, and a gradually rising fever are almost invariably present. About 50% of our cases showed an initial diarrhoea, the other half constipation. About half had headache but not the severe form seen in the adult. Abdominal pain is not common and is, as a rule, not localized. Delirium at the onset is seen only in the most severe cases. One of our cases had a chill at the onset. Only three had epistaxis. The period of rising temperature is said to be shorter in the child than in the adult but our cases did not show this with the exception of those of the severest type. The day of disease on admission to the hospital in our series of cases ranged from four to fourteen days.

Symptoms and Clinical course—There is usually a period of well sustained, continuous fever with an average of 102° to 104° depending upon the severity of the infection. This continues, as a rule, until the end of the 2nd or 3rd week when the temperature becomes irregularly remittent and intermittent and has a general downward tendency. A striking feature of the temperature chart in children is the irregularity and multitude of variations it shows. This may be very striking and one cannot predict from one day to the next what the temperature may be. Sometimes the chart shows the septic "Church Steeple" character for 2 or 3 days, followed by a few days of slight rise in the temperature, then a remittent type of fever may occur. One of our cases, a boy, thirteen years of age, who showed the typical clinical picture of typhoid fever, ran a continuous temperature for nine days and on the tenth day had a crisis after which the temperature remained normal. This is reported as occurring in children but even here it is rare. This case had the shortest period of fever of any of our cases. The average period was twenty-four days. Our case which showed the longest period of temperature was one of reinfection, in all 55 days. This was a boy 11 years old, who had over three weeks' continuous fever averaging 104°, was very ill, irrational and had incontinence. There were numerous crops of rose spots. From the twenty-first to the thirty-first day of his illness the temperature was irregular, averaging 102°. From the thirty-first to the thirty-eighth day there was a low continuous fever, average 99°, thirty-eighth to fifty-fifth day irregularity remittent from normal to 103°.

During the reinfection the patient was again very ill and irrational but there were no new rose spots and the spleen did not become palpable again. Reinfection occurs in about 8% of cases and as a rule during the fourth week. We had three cases. A typical one was a male nine years of age, admitted to the hospital on the fourteenth day of illness, dull and apathetic. Rose spots were present and the spleen was palpable. Up to the thirtieth day of illness he ran an irregular temperature from normal to 102°. For three days the temperature remained normal. During the next two days there was a step like rise. This was followed by a continuous fever for five days and for the following four days the temperature was irregular and became normal on the forty sixth day of illness. The rise in temperature after it has fallen to normal does not always mean a re-infection as it usually does in the adult. One of our cases showed this very well. This was a girl ten years of age who had a severe infection. A blood culture was positive on the ninth day of illness. On the twenty-seventh and twenty-eighth day the temperature was just above normal. The patient was apparently past the acute stage and seemed to be convalescent. On the twenty-ninth the temperature rose to 100°, on the thirtieth to 101°, and on the thirty-first to 102°. Her general condition at this time did not suggest a re-infection and a blood culture was sterile. On the following day her temperature was 98°. These slight rises during convalescence are common and are without demonstrable cause as a rule. The lymphatic system is rarely involved. One of our cases, a boy of two years of age with a severe infection, during the last three days of life, developed a swelling below the angle of the right jaw. At post mortem this was found to be due to an adenitis resulting from infection with the streptococcus.

The circulatory system shows very few abnormalities. The pulse rate in children is faster in relation to the fever than in the adult. The comparative steadiness of the pulse despite wide variations in temperature is a striking feature. This was well shown in a girl of ten whose temperature was very irregular and ranged from the tenth to the twenty-eighth day between normal and 102°. Her pulse however, in spite of the irregular temperature, remained about 120 and from the thirtieth to the forty-fifth day the temperature varied from 98° to 100°, yet the pulse remained about 100.

In our cases the foul mouth and coated tongue were as marked as in the adult. Abdominal distention in children is frequently absent and when present is, as a rule, not very marked. Very few children complain of abdominal pain or tenderness. The spleen is enlarged in all cases, generally sufficiently so as to be palpable. The majority of our cases had palpable spleens. The liver is not as a rule enlarged but it was in two of our cases. Knowing how easily a child's gastro-intestinal system is upset one might expect more diarrhoea in children than in adults. In cases of delirium there is usually incontinence. Constipation is the rule later in the disease.

Rose spots are thought to be somewhat less common in the child than in the adult. 50% of our cases showed these typically, as a rule over the abdomen and lower thorax.

Epistaxis may occur as an initial symptom; before admission to hospital it is said to be fairly frequent. Only two of our cases gave a history of it, but 10 cases had it during their stay in the hospital.

Bronchitis is a common condition in severe cases. Only four of our cases had it. Bronchopneumonia occurs not uncommonly as a terminal event. One of our fatal cases showed this. This was a boy two years of age, with a severe infection. Two days before death he showed signs of bronchopneumonia, which was confirmed at autopsy.

Involvement of the genito-urinary system is not common. Toxic albuminuria is frequently seen. Pyelitis and pyelonephritis are occasionally seen in severe cases. We had one case of this in our series: a girl, ten years old, with a severe infection. On admission the urinalysis showed only a febrile albuminuria. On the twenty-first day of disease examination showed albumin, considerable pus, a few red blood cells but no casts. Frequent examinations during the next two weeks showed much the same findings with casts on several occasions. The urine suddenly cleared up and remained so. Recovery of the bacilli from the urine can frequently be done. In some cases persistence of the bacilli during convalescence has been noted. One of our cases, a girl of eleven years with a typical typhoid fever of moderate severity, showed this. On the tenth day of convalescence a routine examination of the urine showed typhoid bacilli in great numbers. Urotropin in five grain doses three times a day was given and after five days the urine was found to be free from bacilli and an examination made one month after the patient was discharged from the hospital showed no typhoid fever bacilli in her urine. Urotropine seems to be almost a specific in these cases, and as in adults, acts within a week if it acts at all.

The nervous system in children may also show signs of the poison. Associated with the high fever in the early stages are drowsiness and apathy and nocturnal delirium is very frequent. All our severe cases showed this. In young children, especially those from two to five years of age, the severe cases frequently have an onset resembling very closely acute meningitis. One of our cases, a boy two years old, had an acute onset with vomiting, diarrhoea and high fever. On the third day he had several convulsions and was admitted to the hospital on the fourth day. He was very toxic, showed marked bowing of the back and retraction and stiffness of the neck. There were no eye signs and the Kernig sign was negative. There was slight abdominal distention. These findings, combined with the fact that the boy's sister was in the hospital with typhoid fever lead us to make a tentative diagnosis of this disease rather than meningitis. The nervous symptoms gradually cleared up, and within two days were entirely absent. The patient then ran a severe course terminating in death on the eighteenth day of his illness.

Routine Laboratory Finding —These show no difference from typhoid fever in the adult. The blood culture is positive during the first week and the Widal reaction is generally positive by the tenth day. There is a leucopenia as a rule but cases of slight leucocytosis occur. In our series leucocytosis was only found when complications developed. The urinalysis shows a febrile albuminuria in the severe cases.

Complications—The outstanding feature is their comparative infrequency and mildness. There are no complications peculiar to this disease in children. The common and severe complica-

tions seen in the adult viz: intestinal haemorrhage and perforation are rare in the child. We did not have a case of either. There were no serious complications in our series except for one of our fatal cases who developed a septic adenitis and broncho-pneumonia. Otitis Media is said to be commoner in the child than in the adult. We had two cases. Superficial abscesses occasionally occur. We had three cases. Bacteriological examination showed the infection to be due to the staphylococcus. One case of severe furunculosis which was very resistent to treatment, showed this same organism. We have had two cases of typhoid osteomyelitis who were treated for typhoid in another hospital.

Diagnosis—Typhoid fever in children is probably much more common than is generally supposed. For this reason all cases of fever in children, where the temperature remains elevated for more than a few days without a definite cause, should be looked upon as a possible case and a blood culture taken. There are but few cases from which blood cannot be readily obtained for bacteriological and serological examination. In babies the longitudinal sinus can easily be tapped, in older children the external jugular vein, a vein on the ankle which is frequently comparatively large and the median basilic at the elbow are possible sources. The median basilic can generally be seen when a bandage is applied to the arm or palpated when not visible.

Treatment—The treatment used in our hospital is the same as is used in adults. In the acute stages a high caloric diet is used changing to soft and then full diet as soon as possible. The efficiency of this treatment was seen in our last group of cases in which all held their weight and a few gained slightly in weight. Hydrotherapy in the form of sponging is used with good results.

Results—These are good. The mortality given in text books is 5% as compared to 7% in adults. We lost two cases which gives us a mortality of 4%.

Post-mortem findings—These do not vary from those in adults except in young children there may be no lesions in the intestines. In one of our fatal cases an autopsy was performed and no lesions of the intestine were found. In such cases the typhoid bacillus must be found in order to make an exact diagnosis. In our case this was done, the bacillus being grown from the heart's blood, spleen gall bladder and intestines.

Summary

Looking at this subject as a whole one draws the following conclusions:

(1)—Typhoid fever in children is not as serious a disease as it is in the adult. This applies not alone to the actual mortality but to the whole clinical course including the complications.

(2)—Typhoid fever is a septicaemia with localization in the intestines except in very young patients where there may be no intestinal lesions.

(3)—Involvement of other systems is similar to that met with in adults.

(4)—The principal symptoms do not vary from those seen in the adult.

(5)—The fever is more irregular. The pulse is faster in proportion to the fever than in the adult and shows a tendency to steadiness despite wide variations in temperature.

(6)—The disease in the young may show a predominance of nervous manifestations.

(7)—Complications are uncommon.

(8)—No difference in treatment is indicated and the results are good.

I wish to thank all those who assisted me in the preparation of this paper. First, Dr. H. B. Cushing and Dr. L. J. Rhea for advice and counsel; second, the Superintendent of the Hospital, Dr. Norman T. Williamson, and his resident staff and finally the nurses who took so much pains in charting the cases.

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THE EFFECTS OF ULTRA VIOLET RAYS ON THE CALCIUM AND INORGANIC PHOSPHATE CONTENT OF THE BLOOD SERUM OF RACHITIC INFANTS*

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SOME eight or nine months ago, an extensive investigation was planned to study the effect of ultra violet rays on the inorganic constituents of the blood of rachitic infants. However, during the past winter and spring only a small number of patients were available for this study. This is probably due in a large degree to the excellent prophylactic measures instituted by the Hospital for Sick Children in cooperation with the Health Department of this city. Although the present report is limited to only six cases, the results obtained are very striking.

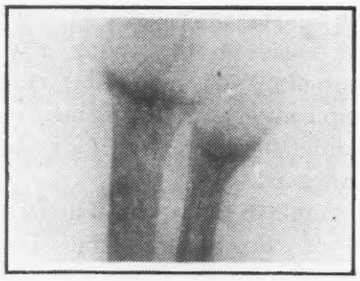

FIG. I.—Roentgenogram of the distal ends of the right radius and ulna of R. P., March 9th, 1922, before treatment with the mercury vapour quartz lamp. This shows the irregular ends of the bones with marked flaring and cupping. (Typical evidences of rickets).

Numerous authors have reported the cure of rickets by exposure to ultra-violet rays from a mercury vapour quartz lamp. (1-6). None of these investigators, however, reported any observations on the effect of ultra violet rays on the calcium and phosphate content of the blood serum. The effect of sunlight (which contains ultra-violet rays) on the inorganic phosphate content of blood has been noted by Hess and Gutman (7). These authors, concluded as follows: "It is evident that sunlight not only brings about a clinical cure of the characteristic lesions but also brings about an increase in the inorganic phosphate of the blood similar to that noted when the cure is accomplished by means of the specific cod liver oil."

This work is open to the criticism that no mention was made of the diets of the infants during the period of treatment. The investigation was conducted during June, July, August, September and October and in some cases it required from four to seven weeks treatment before an increase occurred in the blood phosphate. It is quite conceivable if the infants had

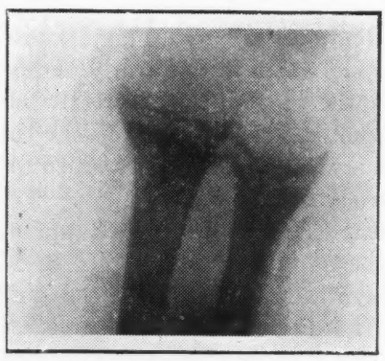

FIG. II.—Roentgenogram of the distal ends of the right radius and ulna of R. P., March 23rd, 1922, after a total exposure of 3 hours to the rays of the mercury vapour quartz lamp. Note the increased density of the bones also the deposition of new bone shown by the dark, irregular, horizontal lines at the extreme ends of the radius and ulna.

been fed on summer milk, that an increased vitamine A content of the diet accounted for the changes produced, for it has been found by Drummond, Coward and Watson (8) that wide variations in the vitamine A content of butter are largely due to differences in the diet of the cow. Although I am convinced that exposure to direct sunlight will increase the blood phosphate, it is not clear that Hess and Gutman sufficiently controlled the conditions of their experiment to justify the conclusions which they made.

The results of the present investigation are

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TABLE I

The concentration of Calcium and Phosphorus in the serum of infants with rickets before and after treatment with the mercury vapour quartz lamp and an ordinary 500 watt incandescent lamp.

Name	Age Mos.	Date	Ca. per 100 c.c.	Inorganic P. per 100 c.c.	Treatment	Previous Diet	Diet at time of treatment
			mg.	mg.			
R. P.	14	2-21-22	9.1	2.8			3% milk 30 cunces
		3- 8-22	8.1	3.1	14 hours exposure to rays of ordinary 500 watt lamp.	Soft diet	Water 10 " Dext. malt 1 " 3-22-22 soft diet.
		3-23-22	9.8	5.5	3 hours exposure to rays of M.V.Q. lamp.		
		4- 6-22	10.0	6.7	Total of 7 hours exposure, M.V.Q. lamp.		
G. A.	5½	2-21-22	9.2	3.4			2% milk 25 ounces
		3- 8-22	7.7	2.8	14 hours exposure to rays of ordinary 500 watt lamp	Breast milk plus whole milk dilutions.	Water 10 " Lactose ½ "
		3-23-22	10.7	4.8	3 hours exposure to rays of M.V.Q. lamp.		
			mg.	mg.			
I. H.	10	3-27-22	8.8	2.8			Whole milk 15 ounces
		4- 6-22	9.1	3.9	3 hours exposure to rays of M.V.Q. lamp.	Breast milk	Water 15 " Lactose 1 "
		4-12-22	9.7	4.4	Total of 4 hours exposure M.V.Q. lamp.		
C. C.	6	3-15-22	9.1	2.8		Butter Flour Mixture	Butter Flour mixture unchanged
		3-23-22	9.7	4.3	1½ hours exposure to rays of M.V.Q. lamp.		
E. T.	8	11-30-21	9.1	3.1		Breast fed	Breast fed plus protein milk.
		12-16-21	10.0	6.0	1¾ hours exposure to rays of M.V.Q. lamp.		
N. A.	6½	4- 1-22	8.8	3.2		Whole milk dilution	Whole milk dilution unchanged.
		4-18-22	10.1	6.1	3 hours exposure to rays of M.V.Q. lamp.		
Average values found in normal infants.....			10.0	5.4			

given in Table I. The methods used for the determination of the calcium and inorganic phosphorus have been described elsewhere (9-10). In all cases the whole body was uncovered and exposed to the rays of the mercury vapour quartz lamp. The distance of the lamp from the body was 60 cm. and the duration of the exposure generally 15 minutes. The anterior and posterior surfaces of the body were alternately exposed. In some of the patients daily treatment was given while in others it was given on alternate days. It is seen that a very marked increase occurred in both the serum calcium and phosphorus after a short exposure to the rays of the lamp. Clinical evidences of healing in all the patients followed this increase. In some cases roentgenograms were taken of the epiphyses and the increase in the calcium and phosphorus in the serum was also followed by definite evidences of deposition of bone salts. (Signs of healing, see figures I and II).

Two patients, R. P. and G. A., had been previously exposed to the rays of an ordinary 500 watt nitrogen filled incandescent lamp. A daily exposure of one hour's duration was given in each case for a period of two weeks. The results (Table I) show an actual reduction in the calcium content of the serum in both patients while the phosphate content was reduced in one infant and only very slightly increased in the other. The clinical evidences of the disease became more marked during the period of treatment. These patients were then exposed to rays from the mercury vapour quartz lamp which

soon caused a definite improvement in their condition.

The question arises whether the improvement obtained in the rachitic infants was produced by any change in the food. The diets of two infants, C. C. and N. A., were not altered in any way. The two patients, R. P. and G. A., had been exposed to the rays from an ordinary incandescent lamp with no improvement, immediately before the treatment was begun with the mercury vapour quartz lamp. In G. A., no change was made in the diet while in R. P., it was changed to soft diet which was the food on which the patient first developed rickets. Changes were made in the diets of I. H. and E. T., but the different foods could hardly account for the very rapid improvement which occurred in the course of the following two weeks.

Care must be taken in the use of the mercury vapour lamp. With small infants it is advisable to start with an exposure of 5 minutes duration, with the lamp 100 cm. from the body. The length of exposure can then be gradually increased and the lamp moved nearer the body, until a maximum exposure is given of 15 minutes duration with the lamp at a distance of 60 cm. from the body.

Conclusions

1.—Exposure of rachitic infants to ultra violet rays from a mercury vapour quartz lamp, for very short periods, caused a marked increase in both the calcium and inorganic phosphate content of the blood serum.

2.—The increase in the calcium and inorganic phosphate content of the serum was followed by clinical and roentgenographic evidences of healing.

3.—No increase in the serum calcium and inorganic phosphate was obtained by prolonged exposure to the rays from an ordinary 500 watt incandescent lamp.

The author wishes to acknowledge his thanks to Dr. Alan Brown, Physician-in-chief, for permission to report these cases.

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While the present paper was in press, two articles have been published in which the authors have shown that the exposure of rachitic infants to ultra-violet rays resulted in an increase in the inorganic phosphate in the serum. The authors of the second paper also reported an increase of the calcium content of the serum. (1) Hess,. A. F. and Unger, L. J. (*Jour. A.M.A.* 78—1596, May 27, 1922). (2) Kramer, B. Casparis, H. and Howland, J. (*Am. Jour. Dis. Children*, 24-20, July, 1922).

The Doctor as Carrier of Poliomyelitis.—*Wallgrem* (*Upsala Lakareforenings Forhandlingar*, March 15th, 1922) reviews recent advances in the epidemiology of acute anterior poliomyelitis which suggest that, as only one member of a family contracts the disease in most instances, the degree of susceptibility varies enormously in different persons. Another modern view is that propagation of the disease is largely dependent on carriers, and in this connexion the author refers to a personal experience. In the summer and autumn of 1919 he was working in a fever hospital in which there were some poliomyelitis. On September 3rd he left this hospital and took up duties in a chest hospital where there was a child, aged 18 months, suffering from tuberculosis of the skin and lungs. The temperature had fallen practically to normal when, on September 20th, it suddenly rose to 39° C. Acute flaccid paralysis of the lower limbs was found; lumbar puncture showed increased pressure, and there was a slight increase in the number of cells. The further course of the case was also characteristic of acute anterior poliomyelitis, and by a process of elimination the author comes to the conclusion that he was the carrier responsible for this case, and he is inclined to suspect that this sinister rôle is not infrequently played by doctors.—*Brit. Med. Jour.*, April 29th, 1922.

SOME OBSERVATIONS ON THE STARVATION TREATMENT OF EPILEPSY

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OUR hopes with regard to the cure of epilepsy are constantly being raised with each announcement of a new remedy or a new method of treatment. Removal of the ovaries has had its vogue, trephining of the skull, its day, and now we hear of "encouraging results" following the removal of parts of the suprarenal glands. In all these methods our faith in the promise of a permanent cure has been newly revived with each new announcement. No doubt this latest fad, that of partial removal of the suprarenals will shortly take its place with its other predecessors among the discarded failures of medical treatment. It is a singular fact that all new drugs and remedial measures for incurable diseases are brought forward accompanied by such an array of bright promises and by so much apparent confidence in them by their promulgators, that the credulous physician and the gullible public, totally oblivious to the failure of hosts of other fads, hail the newest one as the one cure, at last, for which the world has so long been waiting. Turtle serum and injections of iodoform were each in their day the long sought for cure for tuberculosis; Coley's serum is still being tried in each new case of bone sarcoma. It is not so long ago that glowing accounts came to us from a convention held in Washington, of a cure for diabetes and I remember that at the conclusion of one of the papers then read the statement was made that soon diebetic coma would be a thing of the past and diabetes no longer a thing to be dreaded. Without being unmindful of the advance in our understanding of diabetes and of the distinct progress made in its treatment since the advent of this new therapy, the fact remains that people are still dying in diabetic coma and that diabetes is still all too well known to us.

So it has been with epilepsy—it is the remedies that have disappeared, but the dread disease is still with us. A year or two ago we allowed ourselves to be startled by the news of an asserted real cure for epilepsy. A drugless healer in the middle west had been curing epileptics, it was said, by subjecting them to long periods of starvation. This simple treatment was at once tried and as is usual with any new treatment, the results at first were distinctly encouraging. We have had several opportunities of trying out this treatment in the wards of the Children's Memorial Hospital with results not so encouraging as we were at first led to believe. I believe that our observations coincide with those of others who have tried this treatment.

To cite an illustrative case: Gwendolyn B. 10 years old, of healthy parents began to have fainting spells at about three years of age. These spells came at long intervals at first. Gradually their frequency increased until they occurred at first daily, then hourly and finally at about ten minute intervals. These spells were petit mal lasting about ten or fifteen seconds, the patient falling to the floor with each attack. Bromides in large doses and luminal over a prolonged period had no effect whatever upon the attacks. At the time of admission to the hospital she was having between 60 and 100 per day.

Physical examination was essentially negative. There was certainly nothing pointing to a definite nervous system lesion. Mentally she was distinctly precocious.

Upon admission to the hospital she was put to bed and given water freely, but no food except a little clear broth for ten days. On the eleventh day one ounce of orange juice was the only addition made to the diet. The food allowance was so gradually increased that it was only at the end of the third week in the hospital that she was getting anything like a sustaining diet. The bowels were kept open by means of enemas and salines.

During her stay in the hospital she made satisfactory and encouraging progress. While she had sixty attacks during the first twenty-four hours in the hospital, she had only six attacks during the second twenty-four hours

and only one attack each day on each of the three days following. After the fifth day the attacks ceased entirely.

The child was happy in the hospital, rarely complained of hunger after the third day and was quite satisfied that she was getting some food whenever a cup of broth was allowed her. She was discharged to her home after three weeks, perfectly free from attacks and a sufficient, though not a liberal diet, low in proteins, was prescribed for her. Instructions were given to the parents to keep her in bed for another ten days, to keep the diet low and the bowels open with salines. These instructions were carefully carried out by the parents who were greatly encouraged by the results of the treatment. She remained well as long as she remained in bed. Two weeks after her discharge from the hospital the seizures gradually began to return, at first one or so a day, and when last I heard from her about one month ago, she was having two attacks per hour.

It would seem from this case that the starvation treatment is effective only while it is continued and while the patient remains in bed, but that it has no enduring qualities. The explanation of the improvement is first that the patient is kept in bed and secondly that the fermentative and putrefactive intestinal processes, so often the exciting causes of convulsions even in a non epileptic child, are reduced for the time being to a minimum.

So far as children are concerned, one often sees children who have been considered epileptics in whom the epilepsy is found to be purely of intestinal origin and who are therefore permanently cured by the application of strict dietetic measures. There can be no doubt also that such children, if they were regarded as epileptics would be permanently cured by the starvation treatment. Again, there is the neuropathic child whose convulsions are merely an hysterical manifestation on whom starvation would certainly have the effect of suggestion. We have recently discharged from the hospital a child who had been diagnosed as epileptic by several consultants and who, had he been subjected to the starvation treatment, would have been a powerful argument in favor of this new treatment.

Harold S. 13 months old, had been having three or more convulsions daily ever since three months of age. The convulsions were refractory to treatment at home and he was referred to me for an opinion. Upon closely questioning the mother it was learned that he had a convulsion only when he was crossed, that it was possible to keep him free from attacks by giving in to his every whim, and by having him constantly carried about in his mother's arms. I felt that these convulsions were a neuropathic manifestation. The physical examination revealed nothing of importance. He was accordingly admitted to the hospital where for the first time his attacks were observed. It was then learned that whenever crossed he would first have a breath-holding spell, when he would become deeply cyanotic and then he would fall into a generalized convulsion which would last two or three minutes. After each convulsion he would fall into a deep sleep in which he would remain for an hour or more. I gave orders that he be placed in a cubicle by himself and left entirely to himself. He soon learned that no one was paying any attention to him and the convulsions promptly ceased. This child has been entirely well since his discharge from the hospital two months ago.

At the present writing there is in the hospital an epileptic child on whom starvation was tried for about nine days with very unsatisfactory results. The starvation had to be stopped because the child was fast going into a status epilepticus. He was eventually controlled by three grains of luminal and sixty grains of bromides daily. I believe that the explanation of the failure lies in the fact that there was no intestinal factor in his epilepsy and that therefore no source of irritation was removed by the starvation.

One is forced to the conclusion that the water treatment is only of temporary benefit in cases of epilepsy in whom intestinal putrefaction or fermentation may act as an excitant, and that we still must rely on one or other of the sedatives such as bromides or luminal or both for a greater degree of relief. The water treatment may be useful in those epileptics who have series of attacks at certain long intervals, when the patient may be starved every two or three months for a period of ten or twelve days. When dealing with children we must first eliminate every other possible cause of convulsions before branding the child as an epileptic, for it is the neuropathic child and the one whose convulsions are purely of intestinal origin who are so apt to mislead us into drawing erroneous conclusions with regard to the efficacy of one or other form of treatment of true epilepsy.

POST OPERATIVE COMPLICATIONS OF THE RESPIRATORY TRACT*

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COMPLICATIONS of the respiratory tract develop after operation with greater frequency and more serious consequences than most surgeons and anesthetists appreciate. No clinics and no clinicians are immune especially if they make careful observations and keep accurate records. Collected figures that are reliable, such as given in Table I. show that on the average one case in every forty-five operated upon develops a respiratory tract lesion, and that one case in every two hundred dies from the complication. This incidence alone should negative the impression which many surgeons have, that respiratory tract complications, if they do occur, are inconsequential and give rise to no mortality.

Table I.

	Operations	Morbidity	Morbidity %	Mortality	Mortality %	Mortality % of Morbidity
Cutler and Morton (1), Mass. Gen'l	3,490	65	1.8	33	.94	50.7
Armstrong (2), Montreal Gen'l	2,500	55	2.2	32	1.28	58.1
Mayo Clinic (3)	16,317	220	1.32	15	.11	9.6
Von Lichtenberg (4)	23,673	440	1.9			
Cutler and Hunt (5) Peter Brigham	1,562	55	3.52	11	0.7	20
Decker, Pittsburgh, 1920	5,976	69	1.2	29	0.5	42
Decker, Pittsburgh, 1921	2,125	16	0.7	6	0.3	37.5

Last year I (1) reviewed a series of 5,976 cases operated upon consecutively in the surgical services at St. Francis Hospital and my own at Presbyterian Hospital, Pittsburgh, in which series the morbidity was 1.2%, and mortality 0.5%, both comparatively low figures. (See Table I). One, however, should make due allowance for statistics. In our series we excluded minor cases which had no anesthetic or remained in the hospital less than two days, cases of primary surgical respiratory tract disease e.g. suppurative pleurisy, in which respiratory tract complications are to be expected, cystoscopic examinations, and finally nose and throat cases e.g. tonsillectomies where the patients remain in the hospital for so short a time, that records of the post-operative course are not available. Nor in our report did we take cognizance of the milder respiratory tract complications such as coryza, pharyngitis, and tonsillitis—inasmuch as they involved no serious consequence to the patient and furthermore were incompletely recorded. As a result of this study we were at least certain that respiratory tract complications do not occur more frequently in Western Pennsylvania than elsewhere. In this connection we feel quite sure that anthracosis is not a factor in their incidence inasmuch as a large number of our patients are mine and mill workers who have anthracotic lungs. It is probable that anthracosis has no disease significance as Klotz (7) and Haythorne (8) have pointed out from their laboratory research, other than that by interfering with free lymphatic drainage resolution of pneumonia is delayed, and that by stimulating fibrosis it is an aid to the localization and encapsulation of tuberculosis.

In the last sixteen months from January 1, 1920 to May 1, 1921, we have extended our observations, and now report 2,125 cases from the same sources as in our previous study (the surgical services of Dr. R. T. Miller, Mercy Hospital, Drs. R. R. Huggins, B. Z. Cashman, W. O. Sherman, and E. W. Meredith at St. Francis Hospital, and my own at Presbyterian), and with an even lower morbidity and mortality of 0.7% and .03% respectively. (See Table I.)

Table II.

	1920	1921
Lobar pneumonia	45	8
Broncho pneumonia	7	6
Bronchitis	7	2
Pleurisy:		
Dry	7	
Serofibrinous	2	
Empyema	1	
Pulmonary embolism	2	
Pulmonary abscess	0	1
	71	18

*Read in Surgical Section, Ontario Medical Association. June, 1921.

The series shows the usual preponderance of pneumonia, this time nearly equally distributed between the lobar and lobular types. This corresponds more nearly to the findings in other clinics though Cutler (9) in 1,600 cases at the Brigham Hospital this last year has found only one case which he has called lobar pneumonia.

It is beyond the limits of this paper to enter into a full discussion of the clinical course of the post operative respiratory tract complications so we shall present only a brief summary of some of the important features as we have observed them in order that we may more fully consider what to us is of more practical import their etiology and treatment.

Pneumonia is by far the most frequent and serious complication, in our series being responsible for 75% of complications and 90% of the mortality. Autopsy reports are scarce but those published show that there may be every known type of pathology including lobar, lobular, (broncho), embolic (infarction), gangrenous, hypostatic and lastly a type important and frequent which corresponds to a type of non-surgical pneumonia called by the French School, maladie de Woillez, and indeed resembles closely, as we have seen it, the gross appearances of influenzal pneumonia. In this type the characteristic features are marked engorgement of the pulmonary vessels, and unorganized exudate in the alveoli containing little or no fibrin. Grossly such a lung looks and feels beefy, is heavier than normal, is slightly crepitant, exudates frothy reddish fluid and presents no evidence of hepatization.

Clinically on the basis of physical signs, we distinguished the lobar and broncho types, and again, depending on the time of onset several more or less well defined groups. (1) Those cases developing immediately after operation or within a forty-eight hour period. (2)—Those developing within the first week after a post operative period. (3)—Those of a later stage of convalescence. (4)—Those that were terminal in type occurring in debilitated individuals usually as an ante-mortem incident, and discovered at least once at autopsy. These terminal cases showed no frank physical signs except those of circulatory stasis and were not associated with cough or rise in temperature.

Cases developing during the surgical convalescent period were not apt to be severe in type or outcome unless associated with some exhausting surgical condition. One of our cases with fecal fistula secondary to suppurative appendicitis developed a lobar pneumonia on the twenty-fourth day after operation and died in four days.

Much more frequent and severe are those cases which came within the immediate post-operative period—that is the first two days. They comprised in our series 62% of all the pneumonias as compared with the 27% which began in the three to seven day period and 10% which started in the convalescent period. These cases have often been called "ether pneumonia," but improperly so, for we know that while some of them belong to an irritation class they are not necessarily the result of anesthesia. In this group there was a sharp rise of temperature to 102°-104°, usually without chill, associated with increased frequency or respiration cough in the majority of cases, with or without muco-purulent sputum, but occasionally rusty. About 20% had pain in the chest. The physical signs appeared within twenty-four hours perhaps only as localized rales and diminished breath sounds which cleared up in several days or went on to definite dullness, bronchial voice and breathing. These signs of consolidation often persisted after defervescence, which occurred by lysis in 90% of cases that recovered in from three to ten days—Whipple (10) believes, as we do, that many of the sharp temperature rises in the forty-eight hour period, and usually considered as normal postoperative reaction, are really cases of postoperative pneumonia. They are not diagnosed as such because physical examination is not thorough or because they do not have physical signs frank enough to be recognized. Whipple (10) found the X-ray helpful in locating lesions of this sort and in many of these early cases a rather characteristic appearance in the lung of a wedge shaped shadow with base directed downward and outward toward the periphery of the lung, and apex toward hilum. This, however, we believe is the characteristic appearance of early lobar pneumonia of any type. The helpfulness of X-ray in diagnosing obscure or doubtful pneumonia, or even the type of pneumonia cannot be over estimated, though it is a method not open to universal application, since for the safety of the patient it necessitates the use of an excellent portable X-ray apparatus.

Cases which developed in the third to the seventh day differed little in their clinical course from non-surgical pneumonia with this exception, that a certain percentage in our series, as was true of the forty-eight hour group, did not have subjective symptoms. With their quiet breathing only

slightly accelerated, good color, and moderate temperature, they might easily have escaped the diagnosis of pneumonia had it not been for physical signs. These cases do well, and are responsible perhaps for the deep seated impression in the minds of many surgeons that postoperative pneumonia is not a serious matter.

Cases which developed in what is the surgical convalescent period fell into one of two categories (1)—a group the result of exposure and chilling, which ran an ordinary course and (2)—a group which may fairly be said to have been the result of embolism—with resultant pulmonary infarction. The onset here was sudden with severe and persistent pain with slight cough and sputum slightly blood tinged.

Pleurisy—Eleven cases occurred either as a primary lesion or several times as a sequela of a postoperative pneumonia and presented three types, dry, sero-fibrinous, and suppurative. Most of the dry cases developed in the second week after operation and were evidenced simply by pain in the chest with or without friction rubs, and usually without elevation of temperature, pulse or respiration. Pleurisy with effusion and empyema on the other hand occurred earlier and most commonly when there was a localized or general upper abdominal peritonitis affording an immediate source of infection via lymphatics. It is rarely that empyema follows a postoperative pneumonia. The seriousness of pleurisy attaches to the suppurative type. For example, Burnham (11) in his study as they occurred at the Presbyterian Hospital in New York reported six empyemata all fatal.

Bronchitis—Occurs as a complication after operation much more frequently than is recorded in clinical records, so that the figure of nine cases, as given, represents only severe lesions. At least three instances with purulent sputum containing pneumococci bordered upon bronchopneumonia, though there were no definite physical signs of consolidation. X-ray, had it been utilized, might have demonstrated pneumonia. It is quite exceptional for bronchitis to result fatally though one in our series did die ten days after a cholecystectomy under ether of one hour's duration.

Lung Abscess—We believe occurs very seldom in general surgery. The one case of our series was secondary to a lobar pneumonia, which developed immediately following the repair of a gastrocholecystic fistula. The abscess began on the thirteenth day after operation and ruptured spontaneously two weeks later. This case ultimately died two months later from acute dilatation of the heart, following a secondary cholecystectomy and removal of common duct stone. Undoubtedly the cardiac weakness which developed was dependent upon the earlier pneumonia and abscess. In nose and throat surgery pulmonary abscess is a potential complication by reason of the likelihood of aspiration of foreign material from the mouth and throat, such as septic plugs from the tonsils. Lord (12) refers to an incidence of 10% in this field—though several laryngologists of large experience with whom we have communicated have never met with lung abscess.

Embolism of the Pulmonary Artery is usually grouped with respiratory tract lesions though it might be properly considered as a circulatory complication. Fortunately it is infrequent, for it is nearly always fatal. It happens at any time during a surgical convalescence without warning. It is indeed one of the tragedies of surgical experience. One of our two cases did survive, presumably because of either incomplete blocking of the artery or the plugging simply of one of its branches.

Pulmonary Tuberculosis—It is probable that operation itself is not responsible for the development of a pulmonary tuberculosis in an otherwise normal lung. At least we can find no record of such a happening. At any time that pulmonary tuberculosis does follow operation, it is because a healed or latent process has been lighted up. We believe that an active tuberculosis in the lung will be made worse or disseminated elsewhere if inhalation anesthesia is used.

Mediastinitis is a complication which did not occur in our series. Whenever it has developed it has been highly fatal. Cutler (1) refers to three such cases in his series from the Massachusetts General Hospital. Those cases are potential where surgery of the lower neck in the presence of sepsis, or instrumentation of the oesophagus and trachea and bronchi are carried out.

Pneumothorax is another infrequent complication and one which we have not observed. Obviously it may occur in operation on the chest wall and on the upper abdomen, if the diaphragm is injured. This is likely to happen in nephrectomy when the kidneys are adherent to the diaphragm especially because the pleural sac extends normally below the twelfth rib.

It is a serious event for an individual to develop

a respiratory tract complication after operation. Even if he recovers it is at the expense of a prolonged convalescence, entailing an increased economic and sociologic burden upon the individual, hospital, and community alike. But about forty per cent do not recover. The rate is especially high where there is sepsis or cachexia, or where shock and hemorrhage have supervened. In our series of thirty-five deaths, there were twenty with acute pyogenic foci; in three, shock and hemorrhage; in three, cachexia, and in three, senility.

The question may be raised whether the respiratory tract complications themselves are responsible for the mortality. It would seem that in twenty-one of our cases or 60% that the complication was definitely the cause of death, and probably in eight more was the factor which overbalanced the possibility of recovery. Probably only six would have succumbed to their surgical lesion. Of the complications pneumonia, thrombo-embolism, and mediastinitis are the most prolific sources of mortality. Empyema too is highly fatal.

When one comes to a consideration of the etiology of the various lesions one is impressed by the number and variability of its factors. They can be divided at once into two general groups, predisposing and the exciting or bacteriological. The various predisposing factors in turn can be grouped into (1)—exogenous as they arise from environment or external causes. (2)—Endogenous which are concerned with the patient's physical condition, either general or local. In the order of their importance we believe that the exogeneous chief factors are (1)—Exposure of the patient. (2)—Anesthesia. (3)—Sepsis. (4)—Hypostasis in lungs from cardiovascular lesions. (5)—Thrombo-embolism and those factors depending upon it.

Exposure of the Patient to chilling before and after operation is, in our judgment, a most frequent contributory factor. The ways in which this actually takes place, whether before operation, in the operating room, during recovery from anesthesia or late in convalescence, are too well realized to need recording. They have to do with improper ventilation, (draughts), bed clothing, room temperatures, and wearing apparel. We are familiar with the infection of the nasal passages and pharynx, which often follows exposure of local surface or general body surface to chilling. In an analogous way, undoubtedly, the lower respiratory tract is affected. The mechanism of this is perhaps not proved and rather a matter of speculation. It is usually ascribed to a congestion as a result of vasomotor depression through the sympathetic nerves. The equilibrium between the host's power of resistance and bacteria is upset to the point that bacterial invasion takes place. Meade and Grant (13) conducted some experiments by a thermo-galvanometric method to determine the effect of lowering of surface temperature upon the nasopharynx. They found that chilling of body surface causes a reflex vaso-constriction and ischemia instead of congestion of the nasal and pharyngeal mucosa, which is the opposite of what is usually believed; and contrariwise that warming of body and face cause a corresponding dilatation of the vessels. The decreased cell respiration which ensues, retards removal of products of cell metabolism, and decreases the supply of specific antibodies. Jonathan Wright (14) too, believes that some similar biochemical change is antecedent to infection. Another factor may be the increase in volume of respiratory exchange which results in local depression of the temperature of the mucous membrane, rendering it more susceptible to bacterial attack.

Huntington (14) in a study of temperature and humidity as it affected post-operative cases, came to the conclusion that a proper humidity is really more important than a warm temperature for the well being of the patient. He suggests that immediately after operation the relative humidity should be 80° or more and then gradually diminished so that in a few days it averages 60% when the temperature is 64°. He based his findings on a study of mortality statistics in two Boston Hospitals. While not conclusive and taking no regard of other factors they are quite suggestive. After all there may be some advantage to the patient to have steam from an adjacent sterilizing room pouring through to the operating room, even though it makes for the considerable discomfort of the operator.

Anesthesia—Inhalation anesthesia, especially ether, has been blamed from time immemorial as the cause of post-operative pneumonia and bronchitis. While it is true that a few cases may be justly attributed to anesthesia, most can not be. There is much evidence to bear this out. Complications follow all types of anesthesia—local and spinal as well as inhalation, as any anesthetic records will show. Gottstein (15) and Henle (16) for instance, reported in a series of laparotomies that more pneumonias followed local than

general, though with less mortality. It must not be forgotten, however, that oftentimes local anesthesia is chosen because of the grave physical condition of the patient, or because of evidence of recent respiratory tract infection, either one possibly being the factor responsible for the pneumonia. In our own series of eighty-five cases, as shown in Table IV, ether was given in sixty-nine, novocaine was used in six, spinal in seven, and chloroform in three.

The incidence per cent, however, shows a morbidity quite alike for both novocaine and ether. Nitrous oxide escaped entirely, and while it is not etiologically immune, it is, in our experience, less likely to stir up irritation than either ether or chloroform. If, however, there is a suspicion of respiratory tract inflammation present, we feel that inhalation anesthesia is to be avoided.

Further evidence that anesthesia is not responsible for respiratory tract complications is found in the circumstance that many cases in which ether is taken badly, where there is much mucus, dyspnea, and cyanosis involving an obstructed air way to the lung, do not develop any trouble, and conversely that complications sometimes follow technically perfect anesthesia This, however, does not lessen the responsibility of the anesthetist or the desirability of a smooth anesthesia free from cyanosis, vomiting and mucus. Aspiration of throat contents, that is mucus and food mixed with pathogenic bacteria such as pneumococcus, streptococcus, undoubtedly at times is a contributory factor. Holscher (17) conducted a number of experiments with reference to the role of mucus. He showed that mucus travels via the bronchi to all parts of the lungs if the head is not held over on the side and the mouth is not properly drained; and that if there is any obstruction to respiration, the violence of breathing causes increased aspiration of mucus. If, however aspiration alone were a great moment we are sure that more pneumonias and lung abscesses would follow tonsil operations than are reported, inasmuch as in this type of case there is excellent opportunity for the descent into the bronchi of foreign material. Some have averred that the time element in anaesthesia is an important factor, but we are quite certain that expert administration is very much more essential.

Type of Operation including operative technique. How much responsibility attaches to the type of operation and location of operative field is a matter of opinion. Statistics all seem to show that complications follow abdominal operations more frequently, even four to five times so, than elsewhere. In our series the record was abdominal 59, hernia 12, head and neck 6, extremities 7, thoracic wall 1. This may be due to the frequency of abdominal sepsis. It may more reasonably be accounted for by the diminished aeration of the lung and inability of the patient to cough out mucus freely, which follows the limitation of diaphragmatic excursion in this field, and is incident to trauma of rough retraction, or the application of tight binders and dressings, or abdominal distention, or the pain which results from incisions close to the ribs.

We have not found that the season of the year, age, or sex of patient, are factors of any great moment. There is, however, a tendency for incidence to follow respiratory tract epidemics. For instance, during the influenza epidemic of 1918 the incidence of post-operative respiratory disease in the army camps e.g. at Camp Custer kept pace with non-surgical inflammations

In a consideration of endogenous predisposing causes we feel sure that *infection in the respiratory tract* is a most, if not the most, prolific factor. It needs only assertion to establish, though evidence is concrete, that an infection recently subsiding or subacute such as coryza, or laryngitis, can and does cause further complication after operation. Certainly no patient thus afflicted should be oper-

TABLE IV—ANESTHESIA

	Ether	Spinal	Novo-Caine	Nitrous Oxide	Ethyl Chloride	Chloro-form
Lobar Pneumonia	45	6	2			2
Broncho-pneumonia	9		2			1
Bronchitis	8					
Pleurisy	8	1	1			
Empyema	1					
Pulmonary Abscess	1					
Pulmonary Embolism			1			
Total	69(73)	7	6	0	0	3
Total Anesthetics	5971	1245	649	145	21	36
Incidence %	1.1	0.6	0.9	0	0	8.3
Cutler—Hunt	3.4	0	1.7	4.4		0

ated upon unless in case of extreme emergency and then with more than usual precautions. The evidence is not so clear in the matter of chronic inflammatory lesions such as chronic bronchitis and emphysema. They undoubtedly are predisposing factors, especially if they are associated with the hypostasis of cardio-vascular insufficiency. There is little doubt too that hypostasis alone, such as for instance occurs in myocarditis, enhances bacterial invasion.

Sepsis is also a very important predisposing factor, and acts in one of two ways either in impairing the patient's power of resistance, or affording a focus from which infection may travel to the lungs by blood stream or the lymphatics, presumably as septic emboli. That this does happen is true, particularly in septic conditions in the upper abdomen where there is possibility of direct extension from the subphrenic abdominal viscera and peritoneum, but we feel sure that emboli, septic or non-septic, are not as frequent a cause as Cutler, for instance, would have us believe. His arguments for emboli as a primary and universal etiologic factor may be summarized as follows: Thrombosis takes place in every operation especially in septic fields. Emboli are split off by movements of the body and the operative handling. In abdominal operations, especially in the epigastrium, the conditions are suitable, namely perpetual motion of the diaphragm, frequent sepsis, and direct anatomic channels, and it is this field that shows the highest incidence. He makes this interesting statement, but in our opinion a speculative one, "If we have a subacute lung condition and shower into it fine emboli, even if not septic, they will cause sufficient circulatory pressure disturbance to cause the existing latent process to flare up."

Careful consideration of the evidence leads us to disagree with the embolic view point, not so much on anatomical grounds for we believe that the anatomical channels of communication of both the lymphatics and venous system are well established. The lymphatic vessels from the mesentery, liver and stomach either pass through the diaphragm directly to the anterior and posterior mediastinal nodes and thence into the bronchial lymph nodes, or they pass into the thoracic duct and ultimately in this way drain into the lungs. Then the mesenteric veins, which are tributary to the portal system, anastomose freely with the gastric, oesophageal, retroperitoneal and hemorrhoidal veins, in this way affording a certain though indirect portal of entry to the lungs.

It is rather on bacteriological, pathological, and clinical grounds, that we feel that embolism is an infrequent rather than constant factor. The bacteriology of respiratory tract complications has been studied as far as we know only by Whipple (10) and Cleveland (18). Their findings with reference to postoperative pneumonia are registered in Table III. It will be seen that the pneumococcus is responsible for the majority of cases. Inasmuch as the habitat of the pneumococcus is the respiratory tract and not the abdominal cavity, the large number of pneumococcus cases occurring in abdominal operations can not be explained on the basis of septic embolism. We could account for streptococcus pneumonia in this way. But why should we not have, as we do not, a large number of colon bacillus infections of the lung, since this is a predominant organism in abdominal sepsis. The last word on the etiology of pneumococcic lobar pneumonia and streptococcus lobular pneumonia has come from Blake and Cecil (19) in their experimental work with monkeys, in which animals pneumonia develops and runs a clinical course comparable in every way to the human type. They found that the trachea and bronchi are the portals of entry for the bacterial invasion of the lung whether pneumococcus, streptococcus, or influenza bacillus. From the trachea the organisms proceed by the lymphatics to the bronchial lymph nodes at the hilum of the lung and thence by the lymphatics about the vessels and bronchi to the interstitial tissue beginning at the hilum and extending to the periphery of the lung.

TABLE III—SPUTUM EXAMINATION

	Preoperative	Postoperative
Cases examined by mouse inoculation	85	130
Cases not examined	77	32
Group I, pneumococcus	2	4
Group II, pneumococcus	5	5
Group III, pneumococcus	8	10
Group IV, pneumococcus	30 (35%)	80 (62%)
Group III and IV	0	1
B. influenzae	1	5
B. mucosus capsulatus	3	7
B. mucosus capsulatus and pneumococcus 4	0	1
Streptococcus	3	10

They found also that subcutaneous and intravenous injections did not produce pneumonia; in other words that pneumonia is bronchogenic in origin and that invasion of the blood stream, though early, is secondary to invasion of the lung,

which is quite definite evidence, it would seem, that the blood stream carrying emboli is not the etiologic factor. Clinically, on the embolic basis, it is hard to account for lesions like generalized bronchitis or pneumonia which follow a perfectly clean hernia operation done under local anesthesia, or for the fact that pneumonia involves usually only one lung and one lobe of that lung.

From what has been said, we do not wish it understood that we disbelieve in embolism as a factor in postoperative respiratory tract disease, for we know only too well of definite instances, and also cases of pulmonary infarction, and of thrombo-embolism, of the pulmonary artery. For the development of thrombo-embolism, we must go back to those factors which predispose to them, such as local infection, anemia, slowing of the blood stream, excess of calcium salts in the blood, inefficient hemostasis, traumatization of tissues and injury to blood vessels.

From our study of the etiology of the post-operative respiratory complications, we have come to believe that there is no constant or essential predisposing factor. In our series, we were reasonably certain of etiology in only twenty five of our eighty-five cases. In six of these, ether was taken rather badly, two had general sepsis, ten had preoperative inflammation in the respiratory tract, two had evidence of chronic bronchitis. Undoubtedly, in a certain number, exposure was the factor. There was one striking illustration of this in a man who was allowed out of bed sixteen days following an appendectomy for acute suppurative appendicitis. His operation wound had healed kindly. On the third day after being up, he sat by an open window, had a chill that night and ran a pneumococcus group III, pneumonia, in the left lower lobe, terminating by crisis on the fifth day.

In view of the fact that there is no essential predisposing cause we have felt possibly, though it is a matter of speculation, that the crux of etiology is really after all a question of individual equation, and has to do with that indefinable intangible thing we term vitality or power of resistance. It is the thing that explains how one set of individuals in good physical condition and handled with extreme care in a technical way, develop respiratory tract infection while another group in poor physical condition, taking anesthesia badly, traumatized by operative techinque and perhaps even having septic foci, escape.

We have endeavored to establish for ourselves, those cases that may be definite respiratory tract risks. They include the following groups: (1)—Those with a history or evidence of recent acute inflammation. (2)—Those with chronic lesions, such as bronchitis and emphysema. (3)—Those with pulmonic hypostasis, whether of cardio-renal origin, or due to cachexia and old age.

In view of this uncertainty in etiology it behooves us all to take all precautions that we can, to eliminate or reduce the morbidity and mortality of respiratory lesions. In our work, we are trying to carry out the following prophylactic regime.

(A)—*Before Operation*—(1)—Histories are taken and physical examinations are made with special reference to the respiratory tract, and in this way we have discovered operative risks which had led us to postpone the operation—choose our anesthesia with special care and even pass the operation by, entirely.

(2)—Nursing rules designed to prevent exposure of the patient after his admission, are carried out carefully as practicable, and have been responsible for the prevention of upper respiratory tract infection before operation. These rules are modeled after those adopted in the Presbyterian Hospital, New York, and recorded by Whipple (10). They include the following—(1)—A temperature of 70° for the bathroom where routine admission bath is taken. (2)—Patients after their bath are kept in bed if they are to be operated upon the next day. (3)—Sufficient blankets and beds and suitably warm clothing are provided. (4)—Draughts are avoided at all times. In a recent personal communication, Whipple testified to the value of these precautions as follows, "these nursing rules laid down in my papers and followed carefully over varied periods, have shown very definite results in the prevention of colds before operation. A staff which is trained along these lines and which is impressed by the importance of watching out for complications, is very keen in detecting the cases of upper respiratory tract infection. It has been definitely proven that patients on a service where this is not done, have a higher pneumonia incidence."

Counter irritation of the chest with camphorated oil, both before and after the operation, has been quite faithfully carried out in the past year, but without appreciable effect, and this corresponds to Whipple's experience in New York. We are frank to confess a doubt as to the rationale of this procedure as a preventative measure.

(4)—The anesthetic is chosen with the care that the respiratory tract condition demands

quite as much as the cardio-vascular-renal condition. This has led us to use less inhalation anesthesia, spinal more frequently, and in several cases, ether by rectum with, we believe, definitely improved results.

(5)—Oral hygiene is insisted upon; whether this has been of advantage, is uncertain. At least, it has done no harm.

(B)—*During Operation*—(1)—Further precautions are taken against draughts and chilling of the patient with wet solutions. No case leaves the operation room without a dry warm night gown and properly warmed blankets.

(2)—Anesthesia is given by those who are trained especially for it.

(3)—The surgical technique is designed to eliminate the etiologic factors of thromboembolism, as suggested by Ochsner (20). It includes careful asepsis, perfect hemostasis, avoidance of undue traumatization of tissue, especially by gentle retraction, and of needless injury to veins of the extremities by faulty positions upon the operating table. We have been much interested in Oschner's suggestion that transfusion of whole blood will help to prevent thromboembolism, though we have not carried it out routinely.

(4)—Dressings, especially those over the upper abdomen, are applied snugly, but not so firmly as to restrict respiration. Abdominal binders as a routine, have been discarded.

(C)—*After Operation*—Further protection against exposure is carried out. For instance, those cases in Fowler's position are properly jacketed. Free movement in bed is encouraged and elevation of the head and thorax from the flat position carried out, especially in those cases where there is any tendency to hypostasis in the lungs.

Whipple has written us that in the Presbyterian Hospital, New York, following a suggestion made by the consulting anesthetist, Dr. Thomas Bennett, they are routinely turning their patients on the right side till out of the anesthetic, with lessened incidence. The advantage of course, comes from a diminished chance of aspiration of mucus and vomitus.

As we have reviewed our morbidity of this last year since we have put this regime force, we know that the incidence of postoperative respiratory tract complications has been less. It is interesting to note that the five cases which have occurred in my own service at the Presbyterian Hospital were definitely the result of some carelessness, or infraction of the rules we have laid down.

If pneumonia or other complications develop, we believe that the principles of treatment of non-surgical pneumonia or lesions should hold sway. Those in our judgment essential, are good nursing, plenty of out door air, not necessarily cold, forcing of fluid intake especially water, ample cleansing of the intestinal tract and enough digitalis or caffeine to support the heart, and enough sedatives to relieve anxiety and pain.

In conclusion, we wish simply to reaffirm that respiratory tract complications after operations, constitute a distinct menace to the patient. We feel sure they can be minimized by a painstaking prophylactic regime, even though there is no constant etiology.

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SOME WORK WITH BLOCK AND LOCAL ANAESTHESIA*

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IN the Fall of 1917, I read a paper entitled, "Some work with minor anaesthesia," before the Academy of Medicine, Toronto. It was published in the "*Canada Lancet*," in February, 1918. It dealt with minor and major surgery, and reported nine different major operations without general anaesthesia. They were:

1.—Appendectomies.
2.—Two cholecystotomies.
3.—Mastoids.
4.—The tapping of the bowel, and the performing of a lateral anastomosis around the site of obstruction.
5.—Re-section of ribs for empyema.
6.—First stage of the prostate operation.
7.—The removal of a large calculus from the bladder.
8.—An operation on the stomach.
9.—A thyroidectomy.

The first appendectomy with "Local Anaesthesia," was done in 1913 with Dr. McAndrews of Georgetown. There was no mortality in the above series.

Early in the Spring of 1921, the newspapers, with heavy type, carried despatches from London, and Galt, making the statement that an appendix had been removed under "Local Anaesthesia." I was under the impression that such events had been so common, and done so many years previously, the comment was no longer to be expected.

I have glanced over some of my notes and find that subsequent to publishing that paper, other operations have been added to the list. They are:

1.—The opening and curretting of tibias.
2.—Operations for ischiorectal abscesses.
3.—Varicoceles.
4.—Hydroceles.
5.—Varicose veins.
6.—Haemorrhoids.
7.—Ventral hernias.
8.—Removal of breasts.
9.—Inguinal hernias.
10.—Removal of foreign bodies, as shrapnel.
11.—Rodent ulcers.
12.—Cancer of the lip.
13.—Ligation of thyroid poles.
14.—Opening and draining of peri-nephritic abscess.
15.—Colostomy, and considerable minor surgery.

The Local Anaesthetic

Novocain is the drug used for "Local Anaesthesia." It is eight times less toxic than cocaine. Its toxicity is again lessened by the addition of adrenalin, which delays absorption.

During the war, German patents were discarded, and we were offered, novocain, under the various other names, but, with one exception always, chemically the same drug. Each manufacturer selected a trade name for it and put it up in powder, or tablets of varying strengths, and with, or without adrenalin or sodium chloride.—In using these tablets, it is necessary to know their contents, because, depending on the manufacture, some only require the addition of sterile, or distilled water. With some it is necessary to make the solution with normal saline, and with others to add adrenalin.

1.—Procain, (Abbott)
2.—Anocain, (Wingate Chemical Coy.) are the best known of American and Canadian origin. Anocain is made in Montreal. One tablet to a c.c. makes a 2% solution, or roughly, two tablets to an ounce makes a ½ solution.
3.—Novocain, (the Saccharin Co., London) is the best known of English manufacture. It is chemically, para-amino-benzoyl-diethyl-amino-ethanal.
4.—Apothesine, (P. D. & Co.,) chemically differs from novocain. It is (diethyl-amino-propyl-cinnamate.) and the makers claim it has antiseptic properties.

*Read at Surgical Section, Toronto Academy of Medicine, Nov. 15, 1921.

Toxicity—(Novocain)

The toxicity of this drug has really never been established. I have known a pint of ½% solution to have been used without any toxic symptoms. Of course the drug should be discarded if discoloured. The safest way is, to make a fresh solution and to add each time the adrenalin. It is advisable, when injecting it, to reduce the strength as the operation proceeds,—down to as low as ⅛ of 1%, or lower. In other words, to use as little as possible.

In May, 1921, I visited a number of hospitals in the middle west, particularly, at Rochester, Minn. I found them doing a great deal of work without general anaesthesia. Nearly 40% of the operations there, were being performed with "local and block anaesthesia." I was informed that twice as much was then being done, as four months before, in other words, general or ether anaesthesia was rapidly being replaced. It was not an uncommon thing to see ten thyroidectomies done by this method in a day. Practically all surgery above the clavicle, in the extremities, of the pelvis and perineum, was being done with "local and block anaesthesia," or a combination of the two. I was very much impressed with the excellent work they were doing, and especially with the technique of "block and spinal anaesthesia." It was interesting to see a brachial plexus, blocked for a breast operation. The breast itself, of course was anaesthetised with infiltration anaesthesia, and the axilla, by blocking the brachial plexus. A few minutes later, the patient without any apparent discomfort, would have a radical breast operation. Several times I witnessed a thorough dissection of the neck performed under block anaesthesia. Prostates were all removed with sacral, plus, "local anaesthesia," or occasionally by means of spinal anaesthesia.

In the past few months I have had occasion to perform quite a number of operations with "Local and block anaesthesia," including the following:

Hernia; appendectomy; goitre; caruncle (of the urethra); mastoid; varicose vein; removal of Calculi from the bladder; fistula in ano. I have trephined the skull three times, removing a large part of parietal bone to relieve brain pressure and have blocked the brachial plexus for operations on the arm and for breast cases.

In one case of an old empyema, a small catheter drainage tube had slipped into the cavity, the x-ray showed the tube distinctly. With local anaesthesia, I enlarged the sinus to admit easily two fingers. After searching the chest cavity with long forceps for an hour, I was able to remove the tube without excessive discomfort to my patient.

It is interesting to hear patients discussing various subjects with the nurses during the operation, or to even see them moking while on the table. After you have changed your clothing, collected your instruments and visited your patient in his room, it is more interesting to note the absence of restlessness, shock, or vomiting. To find your patient with a smile and sometimes a hand stretched to grasp yours, or occasionally, cntent in reading some article. Of course this picture changes when the local anaesthesia has worn off, but the patient acts more as if the operation had been done some days, instead of a few hours ago. Just as patients are sometimes very nauseated with ether, and some are not at all, so with local anaesthesia, some suffer pain when the anaesthetic has worn off, and some do not seem to suffer at all. They seem to stand it better if they have not been starved. There are cases when nitrous oxide and oxygen helps wonderfully as an adjunct to local anaesthesia.

Just one word about vomiting.—We are all familiar with the vomiting which follows the taking of ether, and with the various types of vomiting, which are sometimes seen after an operation with ether narcosis. A type of vomiting not infrequently follows a major operation done with local anaesthesia. It is much less severe than with ether, but I do not think I have seen vomiting following an operation with local anaesthesia, unless morphine or morphine and hyoscine, had been injected as a prelude to the local anaesthesia. At present I have not made up my mind, whether this vomiting is not merely an idiosyncrasy to the morphine, and not due to the local anaesthesia, at all.

The contra-indications to local anaesthesia, seem to get less each year,—but vary with each surgeon. Two types of individuals that do not readily lend themselves to this method are children and the insane. Cases which a few years ago seemed impossible with this method, to-day are quite possible. Almost any patient, with almost any operation, can be a suitable subject for surgery, with local and regional anaesthesia. A man operating by this method, will do less work in a given time, and be much more fatigued after it, than after a similar amount of work with general anaesthesia. The strain on the surgeon is much greater, much more energy is

expended, much more is taken out of him,—but, I think the patient gains.

Every surgeon cannot, and will not, be able to operate by this method. The type of surgeon who rushes through his work, "pulls" on mesentery, and roughly handles the tissues, etc., will only attempt it with failure. To the surgeon who has forgotten his anatomy, especially the anatomy of the nerves,—to him, it must be a sealed book. With the surgeon up in years, who will not "be born again," surgically speaking, it will never become popular. A new generation of surgeons, not yet in practice, will carry it to its proper plane. In the meantime the types of surgeons who can neither use nor learn to use it, may spend words in its condemnation, but neither *words* nor the *frowns* of the *mighty* will do more than delay the final determination of its proper place.

Of course I do not anticipate that ether will go into disuse, but feel that to-day it is frequently used when local anaesthesia, would be *safer*, and be more satisfactory. After all, our object is to get our patients well and to relieve pain. If we can do it better and more safely by avoiding general anaesthesia, then it should be our training and our duty to do it with "block or local anaesthesia."

Technique

Many books have been written on this subject, especially in recent years. It would be quite impossible to attempt to cover it in a paper like this. Briefly we have three methods of injecting:

1.—*Local*	(a)	Subdermal.
	(b)	Infiltration.
2.—*Block* (or Regional)	(a)	Direct—(into the nerve sheath).
	(b)	Indirect (about and around a nerve sheath).
3.—*Vascular*	(a)	Direct into a vein.
	(b)	Direct into an artery.

It is well first to explain to your patient what you propose to do, really have a "heart to heart talk," explain the amount of discomfort and length of time it might have to be endured. For example: in a thyroidectomy, there will be considerable "choking" sensation and discomfort while working near the trachea, which will be uncomfortable but not painful. Each operation has its unpleasant moments, which can be made much less unpleasant if the patient is prepared in advance, when to expect them. Each different operative site has its own problems for technique. A nervous patient may require a pre-operative treatment of bromides, others morphine, or morphine and hyocine, and some require nothing at all. To be able to decide the requirements of a case is a question of judgment and judgment is the offspring of a well trained mind, mated happily with experience. Frequently it is advisable to inject morphine, or morphine and hyocine, one hour before the operation. The site where the Novocain is to be first injected is touched with a drop of carbolic acid, then, a fine *new* hypodermic needle is inserted, and the skin blanched with the anaesthetic solution. The rest comes easy through a long flexible needle attached to a larger syringe, (say 10 to 30 c.c.) the solution is injected into the required area,—and all is ready for the incision

It is a great advantage to have a nurse who can inspire confidence, or make the patient think of other things than the operation. The nurse sits in a chair usually occupied by the anaesthetist, separated with the patient, from a view of the operative field, by a screen. She sometimes carries on a running conversation, wets the patient's lips, give drinks of water, etc., but should inspire confidence.

I doubt if many will disagree with me, when I say that the day of general anaesthesia has passed (or is rapidly passing) as far as thyroidectomies are concerned, except for the severer cases which are benefited by the addition of nitrous oxide gas and oxygen. Often our chief thought in the non or slightly toxic cases, is the after appearance of the scar. "Local anaesthesia" has eliminated the wretched after effects of ether, lessened the shock and pain, and consequently, the operative mortality. I have performed thydroidectomies where the pulse did not advance more than 20 beats per minute and the patient slept four to six hours the first night. If other arguments are necessary, let me say one seldom sees now, anything but local anaesthesia, at the best known clinics, as Chicago, Cleveland, and Rochester.

Hernias are easily captured by the "Local" method. One can remove, varicoceles, hydroceles, open the vesical bladder, and perform all operations on the extremities. The skull can readily be trephined. Roughly, all operations above the diaphragm, and of the extremities are in the field of local anaesthesia. I do not recommend it as a routine for appendectomies, especially for those patients with a history of several attacks, or even for those with the first attack, although on the same day I have had three abdominal cases, request that I use local anaesthesia. Two had had past experience with ether, and the other was influenced by them.

Sacral or para-sacral anaesthesia, with or without a local, is sufficient for most gynaecological operations, and for those on the perineal and anal regions. Regional anaesthesia, is very useful. I have removed a large sequestrum from the humerus after blocking the brachial plexus, and the patient remained perfectly comfortable throughout. I have freely incised a badly infected arm, after blocking the brachial plexus.

Spinal Anaesthesia.—The nicest technique that I know of, is that used by Dr. Labat, late of rochester, Minn. He used "Rachi-neocaine," (Corbiere laboratories). This comes in ampoules of about 5 c.c. capacity, but contains only the rachi-neocaine in the dose required. The firm supplies an isotonic (?) fluid with which the solution is made up for injecting into the cord. His method was to break the neck of the ampoule and to let the spinal fluid run directly into it and mix with the neocaine, then to re-inject the spinal fluid and neocaine into the cord, taking care of course, to permit more to escape than was necessary for making the solution. In a few minutes the patient would note the tingling sensation in the legs, and then later the loss of sensation, then the patient would lie on the operating table, sometimes in the Trendelenburg position, with gravity ignored. I might say that very little more can be accomplished with spinal anaesthesia than with sacral plus local anaesthesia. That being the case, it is doubtful if spinal anaesthesia is often justified, because sacral plus local anaesthesia eliminates danger of the spinal method, and as a rule is ample for pelvic surgery.

Examples

1.—With the Drs. McQuibbon, of Alma, I saw a young man with a badly infected knee. Temperature 103 , pulse varying from 140 to 160. The man experienced excruciating pain with the slightest movement. With infiltration, the joint was opened and patella turned back, the joint then irrigated and drained. The operation undoubtedly caused him a great deal of pain, but the man said "that the pain was not nearly so great as when the first dressing was done."

Failures are frequently due to lack of judgment, for example:

2.—Recently I operated on a nervous French woman, for fistula in ano. Two years previously a Montreal surgeon had removed her thyroid under ether anaesthetic. She dreaded the anaesthesia, her nerves made her dread everything. I injected enough "Local Anaesthesia," to amputate her leg, but she cried out that I caused pain. Some distance from her body I then clicked two forceps together, she heard the metallic sound and cried out that I was hurting her. She wept when she returned to her room, but, shortly after, and ever since she has insisted that she experienced no pain. I would have shown better judgment had I given her bromides before operating.

3.—Dr. C. Laird, Southampton, assisting. A woman, 58, with gall-stones. She was in very poor health, some pain in the chest. With the fluoroscope, we noted an aneurism of the arch of the aorta. Under local anaesthesia, the gall-bladder was drained, and recovery uneventful.

4.—A man 84, with very foul urine. Stones felt in the bladder with sound. The man was in almost constant pain. With "Local anaesthesia" I removed a dozen stones, the size of marbles. He was in a wheel-chair in two days, and spent the rest of his time as an invalid telling his friends that "he was not aware that the operation had started until he was informed that it was over." He told me that "if I called that an operation he could stand eight of them a day."

5.—A stout man, about 50, with a right inguinal hernia into the scrotum, of fifteen years standing. After the operation, he offered to walk to his room, if I would guarantee that the stitches would hold. He went back in a wheel-chair, with a smile.

6.—At Orangeville hospital, with Dr. Dunning assisting. I saw a young man with advanced appendicitis. Very toxic appearance, rapid weak pulse. I removed the appendix, drained free pus, left in drainage tubes. Uneventful recovery.

7.—A woman, 40. Severe headaches, choked discs, vomiting without nausea, diplopia, poor pulse. The urine contained sugar. Dr. Wm. Goldie, saw her with me. He diagnosed a subtentorial tumour, and that she would not live long. He urged decompression, for relief of symptoms. Relief came as anticipated. She lived in comfort for two weeks, and died in coma as a result of the tumour. An interesting thing about this case is, that the parietal bone was $\frac{9}{16}$th of an inch in thickness. Our ronguers would not grip it. I had to work with trephine chiefly, assisted with hammer and chisel. When returned to her room, she said, "that the operation was painless." Dr. Bennetto of Guelph assisted. Our forearms were sore a few days from trephining.

8.—Dr. Kerr of Elora assisting. A man 55, with Jacksonian epilepsy, and with spastic

paralysis of right arm of long standing. The veins in the scalp were numerous and large. His family urged the operation as they said he was rapidly growing worse. He died twelve hours after the operation. Although $\frac{1}{4}$th of 1% solution was used in his case, I have wondered if sufficient could have gotten into the circulation through a vein to have had any bad effect. I took this question up with a surgeon more experienced than myself with "Local anaesthesia." He said, "Decidedly, no."

9.—The thyroidectomies were uneventful, except the first, which, in my opinion, was long and tedious. Experience made it easier for the others. All of them said they would not fear it again. One was up in two days, and home in five. The others were not much longer.

10.—A woman, 60, with high blood pressure. She had had several abdominal operations and said she would "rather die, than have ether again." She had a protruding urethral caruncle, and distress on micturition. With parasacral and local anaesthesia, the caruncle was removed without difficulty.

11.—A woman, aged 50, had a urethral caruncle, and haemorrhoids, which were removed with the same method, and same result.

12.—A "Loretto Sister," thin and not strong. History of several appendical attacks and of a recent one a few days before. A mass was easily felt in right lower abdomen. I removed a gangrenous appendix, and drained. Gas-oxygen, was used when the adhesions were separated. She made a splendid recovery and assures me that she had not experienced pain at the operation.

13.—A man, 48, with bad bronchitis, developed acute appendicitis. In error he had been given $\frac{1}{30}$th strychine before the operation instead of a sedative and so "gas-oxygen" was used when the wound was being closed. In this case, I consider it would have been wrong to have given ether.

14.—A young man had had appendicitis about ten days before I saw him; very toxic appearance. The caecum was found to be several times its ordinary thickness. The appendix was perforated at its caecal end. He complained of pain from adhesions when I raised the caecum. His recovery was uneventful. Gas-oxygen, could have been used to advantage.

15.—A young man with skull injury over parietal area several years previously, which had been followed by "Jacksonian" epilepsy, of the arm of the opposite side. He had one or more attacks a day. I operated four months ago for pressure irritation. Up to the present he has been free from attacks.

16.—A man of 50 years of age with tabes dorsalis. The bladder had lost its power to expel urine. A soft catheter could not be passed. It was thought advisable to drain the bladder, so without removing him from his bed, the bladder was opened without any difficulty, and without any subsequent memories of pain.

In my paper of four years ago, I made several deductions which have been borne out by experience. There are cases where general anaesthesia is contra-indicated, and where it would be the height of cruelty to revert to the experiences of pre-anaesthetic days. In these cases, I think all will agree that local and block anaesthesia are indicated. Just what is the future of local anaesthesia I am not prepared to say, but I think it has its field, and a greater future than most surgeons now admit.

Pregnancy after Nephrectomy—According to Matthews (*Amer. Journ. of Obstet. and Gynec.*, March, 1922)pregnancy in a woman from whom one kidney has been removed is little more hazardous than in normal women, providing the remaining kidney is functioning properly. Albuminuria may occur as in normal subjects during the later months of gestation, but responds to treatment as well as that of subjects having two kidneys. Marriage and pregnancy after nephrectomy are permissible if tests have shown the remaining kidney to function normally for a year or more, or for three years or more in cases in which the nephrectomy was performed for unilateral renal tuberculosis. In 241 cases of nephrectomy taken from the literature or studied personally the writer found 265 pregnancies, with 250 normal labours and only 2 deaths; 60 per cent. of the patients showed more or less albuminuria during the later months of pregnancy. These patients tolerate morphine well, and may be subjected to other forms of anæsthesia than that by chloroform; chloral hydrate and veronal are borne badly by them.—*Brit. Med. Jour.*, May 13th, 1922.

A STATISTICAL STUDY OF FERMENTATIVE DIARRHOEA, INFECTIOUS DIARRHOEA, ACUTE INTESTINAL INTOXICATION AND DECOMPOSITION OCCURRING IN THE HOSPITAL FOR SICK CHILDREN, FROM OCTOBER 1ST, 1919, TO OCTOBER 1ST, 1920, CONSIDERING ESPECIALLY THE RELATION OF AGE, WEIGHT AND PARENTERAL INFECTIONS TO MORTALITY.

M. A. Cox, M.B.

Toronto

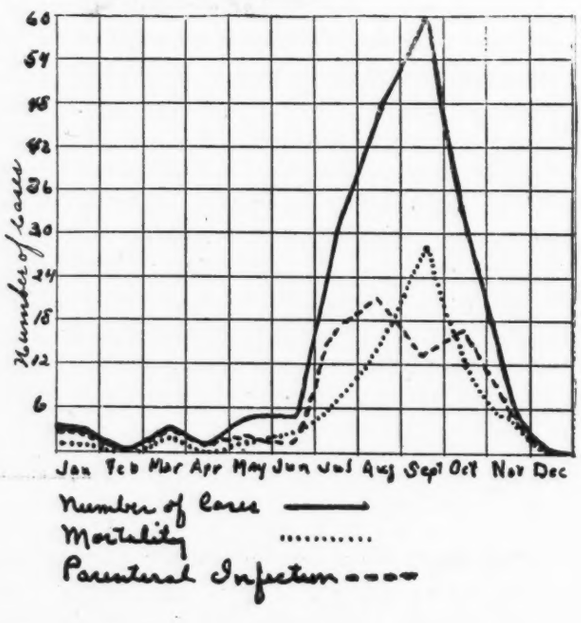
Fermentative Diarrhoea

THERE were 190 cases of fermentative diarrhœa treated in the Hospital for Sick Children during the hospital year 1920. Of these 105 were cured, 12 cases removed after improvement, 2 were removed unimproved, 71 died, a mortality of 37½ per cent. There were 16 cases complicated by nasopharyngitis alone, 39 by otitis media, 7 by bronchitis and 20 by bronchopneumonia. Since some of these children had more than one infection, there were thus 32 per cent. which developed a parenteral infection either before or after admission to hospital. The average duration of illness before admission to hospital was 9½ days while the average stay in the hospital was 20 days.

There were 17 cases admitted in a moribund condition with a mortality of 100 per cent. 107 cases admitted acutely ill had a mortality of 42 per cent. and 62 cases not seriously ill had a mortality of 14½ per cent. The 4 cases admitted when not really ill were all discharged cured.

The number of cases each month, the monthly mortality and the monthly incidence of parenteral infection are illustrated by a combined chart on the last page. I might say that the monthly incidence of cases and parenteral infection corresponds fairly accurately with statistics compiled by Morgan (1) in 1914 and 1915. In his series of cases the percentage of complications in 1914 was 45 per cent., in 1915 was 27 per

CHART I.

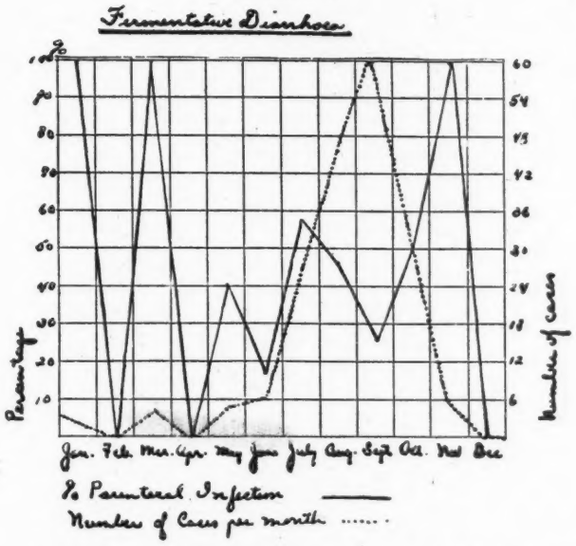


Fermentative Diarrhoea

No. of Cases	No.	Mortality	No. of Cases	No.	Mortality
Under 3 months.....	27	48 per cent.....	Under 6 lbs.....	13	77 per cent
3 to 6 months	60	43 " "	6 to 8 lbs.	35	40 " "
6 to 12 months	63	38 " "	8 to 10 lbs.....	37	40 " "
Over 12 months.....	28	33 " "	Over 10 lbs.....	105	30 " "

cent., and in 1920 it was 32 per cent. The mortality in his cases, however, in 1914 was 61 per cent., and in 1915 was 48.6 per cent. compared with our mortality of 37 per cent. Morgan, however, in his series included infectious diarrhœa as well, which condition when added to our statistics decreases our percentage of complications without increasing our mortality.

CHART II.


Fermentative Diarrhoea
Percentage
Number of cases
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
% Parenteral Infection
Number of Cases per month

Of the parenteral infections considered, broncho-pneumonia had the greatest mortality per number of cases. Otitis media had the second highest mortality. Nasopharyngitis and otitis media were the most common complications.

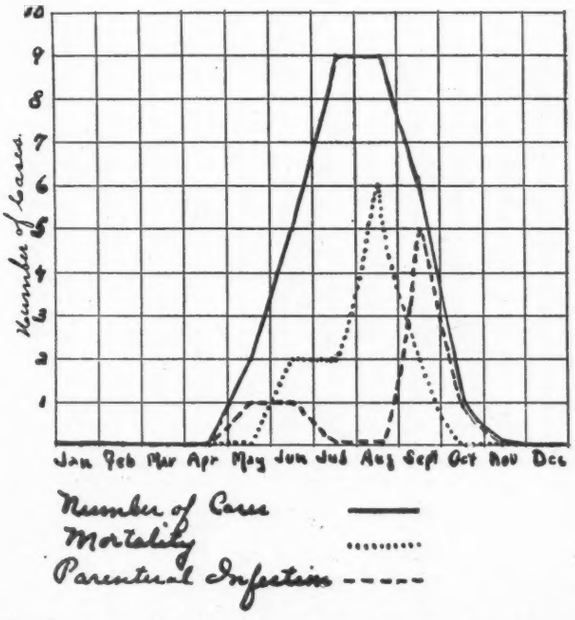
Note: The percentage of cases having a nasopharyngitis would undoubtedly have been greater had we been able to ascertain more accurately the condition of the patients prior to admission.

The inability of very young infants (*i. e.* under 3 months) of low weight, (*i. e.* under 6 lb.) to readjust themselves in the presence of a fermentative diarrhœa, especially in the summer months, and particularly if proper treatment was withheld until the child was either moribund or acutely ill, seemed a greater factor than the intervention of a parenteral infection in increasing the mortality. (Had the younger children lived longer they would probably have had a higher percentage of parenteral infection.)

Infectious Diarrhoea

There were 32 cases of infectious diarrhœa treated in the hospital year 1920. Of these 20 were cured and 12 died, a mortality of 37½ per cent. There were just 6 cases complicated by parenteral infection or 19 per cent. This low incidence of complications is found in practically all statistics on infectious diarrhœa, especially is this true of the papers written by Morgan(2).

CHART III.



The complications in our series were: 5 instances of otitis media and 1 of broncho-pneumonia. The average duration of illness before admission was 6 days. The average stay in hospital was 18 days,

The one case admitted in a moribund condition died, of the 19 admitted acutely ill 53 per cent. died, and of the 12 cases admitted "not seriously ill" only one died, or 8 per cent. (For the monthly incidence of cases, complications and mortality, see chart at the end of the article).

Infectious Diarrhoea

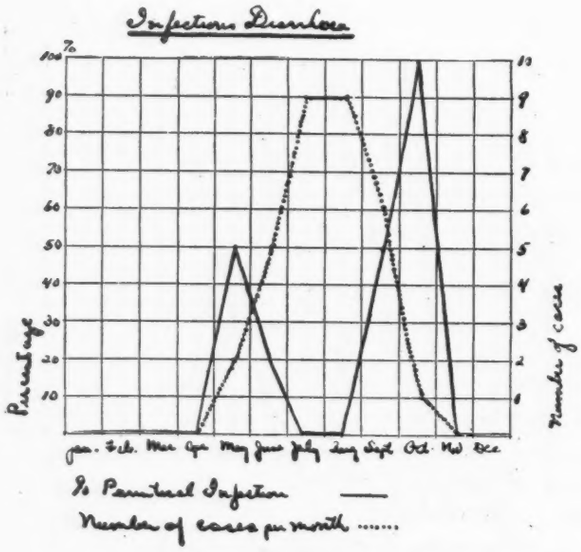
No. of Cases	No.	Mortality	No. of Cases	No.	Mortality
Under 3 months.....	0	0	Under 6 lbs.....	0	0
3 to 6 months	3	100 per cent.....	6 to 8 lbs.	1	100 per cent.
6 to 12 months	4	25 " "	8 to 10 lbs.	0	0
Over 12 months.....	25	32 " "	Over 10 lbs.....	31	35 " "

ACUTE INTESTINAL INTOXICATION

No. of Cases	No.	Mortality	No. of Cases	No.	Mortality
Under 3 months.....	3	100 per cent.....	Under 6 lbs.....	0	0
3 to 6 months	8	62½ " "	6 to 8 lbs.	10	60 per cent.
6 to 12 months	19	63½ " "	8 to 10 lbs.	3	66 " "
Over 12 months.....	16	43 " "	Over 10 lbs.....	33	57+ per cent.

The greatest number of cases occurred in the summer months just as in fermentative diarrhœa. There were none during the colder months.

CHART IV.

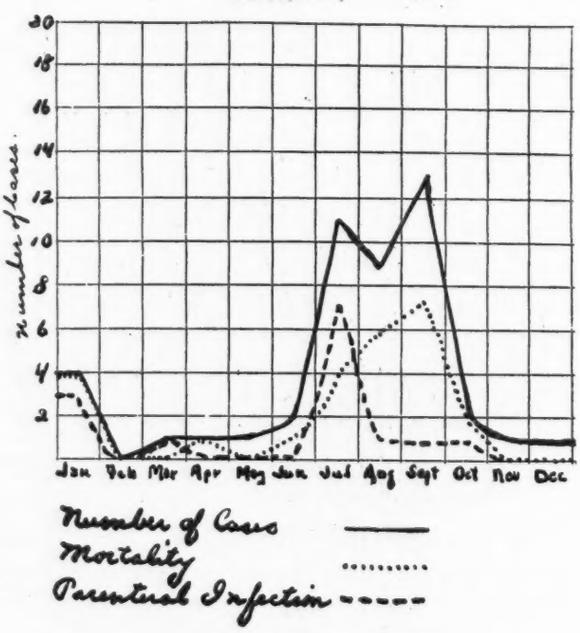


The mortality seemed to depend here on the severity of the enteric infection, the length of time allowed to elapse before treatment was instituted and the general condition of the child and its previous environment more than on any superimposed parenteral infection.

ACUTE INTESTINAL INTOXICATION

There were 46 cases of acute intestinal intoxication in the hospital year 1920, and of these 15 were cured, 4 were removed without showing any improvement and 27 died. A mortality of 58½ per cent. There were none complicated by either nasopharyngitis or bronchitis while in hospital, but 10 cases developed an otitis media and 6 of these or 60 per cent. died. Two cases contracted broncho-pneumonia and both died. Although the mortality was high, the percentage of cases contracting parenteral infection was only 26 per cent.

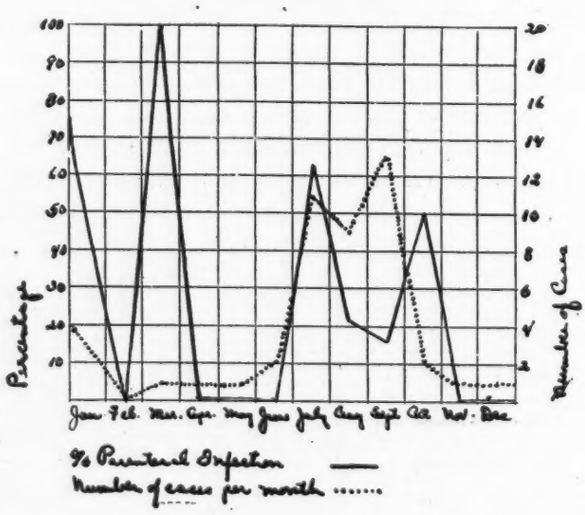
CHART V.



ACUTE INTESTINAL INTOXICATION

The average duration of illness before admission to hospital was 13½ days. The average stay in hospital was 5½ days.

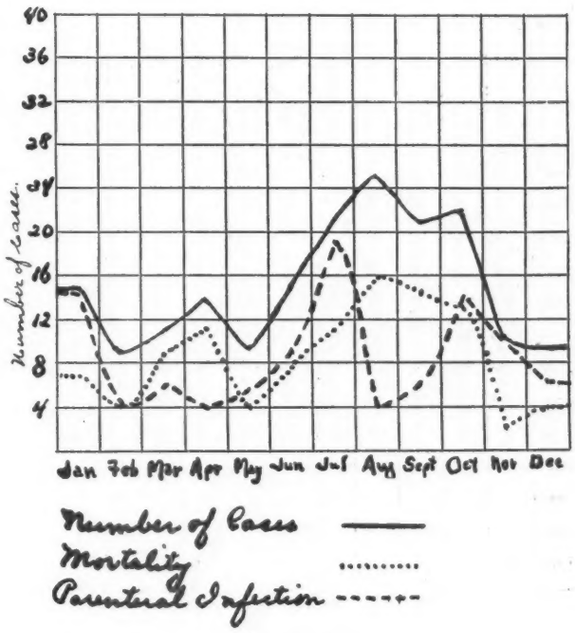
CHART VI.



All of the 9 cases admitted in a moribund condition died, and of the 33 cases admitted acutely ill, 18 or 54 per cent. died. The 4 cases admitted as "not seriously ill" all recovered. Many of the cases were accompanied by either an infectious or a fermentative diarrhœa. For the monthly incidence of cases, mortality and infection, see the accompanying chart. By far the largest number of cases were admitted in the summer months.

While the intervention of a parenteral infection in acute intestinal intoxication certainly made the infant's condition more serious, the mortality seemed to depend rather more on the severity of the intoxication, the age of the child, and more particularly upon the acuteness of the condition before treatment was instituted.

CHART VII.



Decomposition

There were 181 cases of decomposition treated in the hospital year 1920. Of these 56 cases were cured, 18 cases were improved, 3 cases were removed before showing any improvement and 104 cases died. A mortality of 57½ per cent. There were 17 cases complicated by nasopharyngitis or 9 per cent, 49 or 27 per cent. by otitis media, 9 or 5 per cent. by bronchitis and 29 or 16 per cent. by broncho-pneumonia. There were also two cases of lobar pneumonia both of which died. Some had more than one infection. Altogether 37 per cent. developed parenteral infection.

Eleven cases were admitted in a moribund condition, 9, or 82 per cent. of which died. Of the 70 cases admitted as "acutely ill" 54, or 77 per cent. died, and of the 98 cases admitted as "not seriously ill" 41, or 42 per cent. died. The two cases not ill when admitted were both discharged as cured.

In our series of cases, as in the series described by Chappel and Brown, (3) the highest percentage of deaths occurred in the cases of decomposition complicated by a broncho-pneumonia. The next highest mortality occurred in the cases complicated by otitis media. Nasopharyngitis and otitis media were the most common complications. While only 17 cases actually developed a nasopharyngitis in the hospital, probably all the cases having parenteral infection had a nasopharyngitis some time just prior to admittance. (For monthly incidence of cases, mortality and infection, see the accompanying chart.)

In their article covering 271 feeding cases containing a large number of marasmus patients, Chappel and Brown found the percentage developing parenteral infection was 47½ per cent. as compared to our 37 per cent., and a mortality of 35½ per cent. as compared to our mortality of 57½ per cent. However, their series included many simple feeding cases as well as cases of marked decomposition; while the whole of our series of 181 were composed of the latter type of disease.

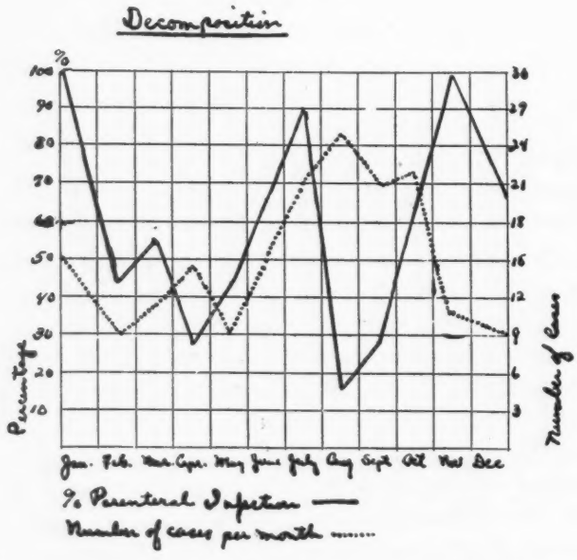
Parenteral infections were far more prevalent in decomposition than in the other three conditions considered and here, as in the other diseases, made the case far more serious, more

Decomposition

No. of Cases	No.	Mortality	No. of Cases	No.	Mortality
Under 3 months.....	64	61 per cent.....	Under 6 lbs.....	46	60 per cent.
3 to 6 months	60	63 " "	6 to 8 lbs.	75	61 " "
6 to 12 months	48	44 " "	8 to 10 lbs.	37	46 " "
Over 12 months.....	9	66 " "	Over 10 lbs.....	26	58 " "

	Fermentative Diarrhoea							Infectious Diarrhoea							Acute Intestinal Intoxication							Decomposition						
	No. Cases	Mort. P.C.	Naso Phar.	Otitis Media	Bronchitis	Bron. Pneu.	Per cent. Mort.	Nc. Cases	Mort. P.C.	Naso Phar.	Otitis Media	Bronchitis	Bron. Pneu.	Per cent. Mort.	No. Cases	Mort. P.C.	Naso Phar.	Otitis Media	Bronchitis	Bron. Pneu.	Per cent. Mort.	No. Cases	Mort. P.C.	Naso Phar.	Otitis Media	Bronchitis	Bron. Pneu.	Per cent Mort.
Jan.	3	33⅓	1	1	1	0	100								4	100		2		1	75	15	46⅔	3	7	0	5	100
Feb.	0	0	0	0	0	0	0								0	0						9	44	1	2	0	1	44
Mar	4	75	0	3	0	1	100								1	0		1			100	11	82	1	3	0	2	54
Apr.	1	0	0	0	0	0	0								1	100						14	78	1	1	1	1	28
May	5	20	0	1	0	1	40	2	0		1			50	1	0						9	44	1	2	1	0	44
June	6	33⅓	0	1	0	0	16⅔	5	40		1			20	2	50						15	53	0	6	2	2	66⅔
July	29	24	3	7	3	3	55	9	22						11	36		5		2	63⅓	21	52	1	11	3	4	90
Aug.	46	30	4	10	1	6	45	9	66⅔						9	66⅔		1			11	25	64	0	1	0	3	16
Sept	60	45	3	4	1	5	23	6	33⅓		2		1	50	13	69		1			7	21	71	1	2	1	2	28½
Oct.	30	40	5	8	1	3	56	1	0		1			100	2	100				1	50	22	59	5	5	0	4	63
Nov	5	60	0	4	0	1	100								1	0						10	20	2	6	1	3	100
Dec.	0	0	0	0	0	0	0								1	0						9	44	1	3	0	2	66
Tot.	190	71	16	39	7	20		32	12	0	5	0	1		46	27	0	10	0	4		181	104	17	49	8	29	

CHART VIII.



difficult to treat and the end result more doubtful. Haynes, (4) writing on the prevention of respiratory infections in young infants, made a plea for greater precautions to prevent the spread of these infections and gave various suggestions to this end. A glance at the following chart will show the necessity of these precautions being increased. All who have watched the weight curve of an infant with marasmus gradually ascend after all the usual measures have been instituted, and have seen the fall in weight and the relapse of the patient when a parenteral infection intervenes, know how serious this problem is. Besides the loss in weight, the response to treatment is lessened and the patient becomes the easier prey for subsequent infections. Aside from the question of mortality, these infections are a serious business and a huge obstacle in the path of successful infant feeding.

For the use of these records, I am indebted to Dr. Alan Brown, Physician-in-chief.

References:

1.—Morgan. *Personal Communication.*

2.—Morgan. *Canadian Medical Journal*:5:211. June 1920.

3.—Chappel and Brown. *Amer. Jour. of Dis. of Children*, Vol. 7: 380. May, 1914.

4.—Haynes. *Arch. of Pediatrics:* 33: 81. February; 1916.

FEAR—A HARMFUL EMOTION, HOW MAY WE ELIMINATE IT FROM THE SURGICAL PATIENT'S MIND?*

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THE offspring of wild animals at birth are without fear, but this instinct needs only a few days of mother training to be developed to a high degree. Unhappy is the lot of any wild thing who loses its mother during the first few days of life for without the fear instinct developed, it soon falls an easy prey to its many enemies.

Fear, therefore, as a means of protection has been of untold advantage to all species in their development, especially to man, who survived, not alone perhaps because he was fit, but because he knew when to retire and live to fight at another time.

This self-preservation instinct to flee from danger and to avoid painful contact, coming down to man through the ages calls forth immense emotional and muscular activity. The thought or memory of an escape from attack may cause the greatest degree of emotional excitement—so also the apprehending of any oncoming encounter with foe or surgeon may produce the same state of mind and body and even though the individual remain passive during it, his exhaustion will be more complete and more profound than if he had given vent to his emotions in some form of motor activity. It is a well-known fact that fear associated with pain may exhaust the organism to the point of death. Our surgical patients whose minds are racked with these emotions of fear and worry are often exhausted before they are anaethetized and are fit subjects for surgical shock or death. In no other disease is the relation between fear and the severity and aggravation of symptoms better shown than in exophthalmic goitre. The reduction in the operative mortality in the treatment of this disease has not been due to any improved technique. It has come about since we have had a better understanding of the disease, and of the harmful effects of fright upon these patients. Crile's great work of anoci-association is a monument to his splendid genius!

Cannon has shown that all bodily functions are altered by the emotions of pain, hunger, fear, and rage—fear and rage being the most harmful. The preoperative rise in temperature, the fast pulse, the tremor, the insomnia and at times the glycosuria, are the results of terror which grips the mind of the patient about to be operated upon; often times the subnormal temperature, the lost appetite, the drawn face, and the langour seen in the postoperative patient are caused by grave worry and doubt. It is surprising to see the improvement in these patients as their mental attitudes are changed by suggestion.

Psychoanalysis reveals that much hysteria, psychoneurosis, and many neurasthenic states have as their origin some past emotional upset—usually one attended with fear or fright. We are all familiar with cases showing hysterical paralysis, aphonia, aphasia, or blindness which can be definitely traced back to some terrifying emotion.

Granted, then, that fear is a harmful emotion which may be the foundation of future mental illness, which upsets bodily economy, retards convalescence, interrupts recoveries, and when severe and associated with pain may cause death, is not an earnest effort upon our part to eliminate this emotion from our patient's mind justifiable? What may we do in a practical way to eliminate it? In the first place, the patient should be considered from a psychological standpoint from the time she is admitted until after she leaves the institution. During her entire stay her mental welfare and comfort must receive the same careful consideration as her physical welfare—for the majority of our patients are mentally, as well as physically ill.

*Read before the Hamilton Medical Society.

The personnel of the hospital should be chosen with great care, and the personality of each worker must suit the position he is to fill. Few of us realize how timid and diffident most of our patients are upon admission, or how easily they may be hurt by apparent inattention or frightened by their new surroundings. It is so important to have their reception a cordial and a friendly one, for the first impressions they get of the hospital and of us are often lasting ones.

The doorman at the hospital, the telephone girls, and the clerks in the office of admission are very important members of the hospital family, for they come in imtimate contact with the patient and the public and yet how little thought and care are displayed in choosing individuals for these important positions. Some hotels and hospitals employ only fat doormen and rightly so, for the fat man is usually good natured and cordial and with it all slow to anger. A rasping, shrill, impatient voice of a nervous telephone girl in the office of admission or the cold business-like filling out of a questionnaire by some frigid clerk oftentimes gives the new arrival the wrong impression of the spirit of the institution. Here a little display of cordiality and friendly feeling are by no means lost, for, as mentioned before, our patients are diffident and easily hurt.

Upon admission to the ward, the new arrival should be waited upon promptly by attendants and nurses who have been specially trained and she must be spared seeing, smelling, and hearing things, which are objectionable to her. In other words, she is best admitted to a ward filled with only convalescent patients who are happy and free from pain. If this can be done, the chances are the patient's mind will be robbed of most of its fright and she will be made to feel at home at once. If, on the other hand, she is allowed to sit for a long time without notice or attention, watching those hurry by who have special missions to perform and who are too busy to greet her, she will feel hopelessly alone; or if she is given a bed next to a post-operative case who is groaning with pain, or one in the throes of having a gastric lavage, or if she be unfortunate enough to get a couch next to a patient in the typhoid state, it is not difficult to imagine her state of mind or to blame her for wanting to be back home again. The hospital that is equipped with many recovery rooms, small wards, and isolation corridors for the post-operative, the very sick, or those in delirious states is indeed fortunate; for the big ward should be made up of the new arrivals and the comfortable convalescent patients. It is wise not to move our operative cases into the big ward until they are free from pain if it can possibly be avoided. No lavages or painful dressings should be done in the ward, nor should a death be allowed to occur there. The mental peace of the new arrival should have this consideration, for fear injected into her mind at the beginning of her hospital stay is a bad impression if she is to have a comfortable and a quick convalescence.

It is not right to have operations delayed for an unnecessarily long time if there is nothing about the patient's case that justifies delay. The surgeon or his associate should visit the patient the night before the operation. At this time the patient is assured that her malady is curable; the operation is indicated and that her physical condition has been found to be perfectly satisfactory. If possible, she should be allowed to talk with convalescent patients who have had similar operations and who have had quick and comfortable recoveries. This will do more to encourage her than we realize. The spirit to win is half the battle in all games of life, and the patient who feels or can be made to feel certain that she is going to come through a surgical ordeal generally does get well. On the other hand, the patient who is convinced he is going to die before his operation, who doubts what he is told about his operation, and who fears that everything is being misrepresented to him, generally does die or have the most stormy sort of a convalescence (I say "he" very advisedly).

The night or nights before operation must be spent in sound, restful sleep. Our patients should not be dehydrated by pre-operative purges and their rest broken by numerous trips to the bathroom. Most surgeons have discarded the castor oil or saline purge, and now rely upon the mildest laxatives or enemas, and rightly so, for our surgical patients need rest and fluids immediately before operation.

Our operations should be scheduled as early as possible to spare our patients the

dreaded wait, the annoying thirst and the prostration from hunger. If for any reason the operation cannot be performed until late in the morning or in the afternoon, we do not hesitate to give our patients warm fluids as coffee, tea, and broths.

The subject of the anaesthetist and the anaesthetic are extremely important and vital if our patients are to be spared fear and fright. The treatment of the exophthalmic goiter patient by Crile's anoci-association has been purposely left out of this discussion because it is so refined and so complicated. Any surgeon, however, who is able to successfully employ the technique of anoci-association to his goiter patients can be justly proud of his anaesthetists and his organization, and can take satisfaction in his ability to perfect such an organization. The anaesthetist must be a skilled psychologist and have a personality which can readily apply different kinds of suggestion to different individuals. At the beginning of any anaesthetic—chloroform, ether, nitrous oxid—a mixture of eight parts of suggestion and two parts anaesthetic is the best one known. If the fears of the patient can quickly be allayed by a constant stream of suggestion, she will no doubt go to sleep quietly and recover from the anaesthetic in the same state of mind. The older text books of surgery show cuts illustrating the stage of excitement during anaesthesia. The services of five or six of the strongest helpers in the hospital were enlisted to control the patient during this period. These terror stricken individuals invariably woke up in just the frame of mind in which they went to sleep—kicking, struggling, screaming, and trying to flee from something horrible. Is it any wonder that these frightened, starved, dehydrated, strychmine-lashed patients had anything but a horror of our hospitals? The writer may be wrong in his belief that the subconscious mind goes to sleep last and is the first to recover in anaesthesia, but there is much evidence to support it.

The question as to whether our patients had better come to the operating room for anaesthesia or be anaesthetized in special rooms is a much debated one. (Here again the exophthalmic goiter case is not considered). If the case can be accompanied from her room or ward by the anaesthetist and welcomed by a friendly group in the operating room where no instruments are in sight, her attention undoubtedly will be so attracted by what is being said to her that her fright, if she has had any, will be forgotten If, however, she fears the operating room she is anaesthetized in a special room. During the anaesthesia she is left entirely with the anaesthetist. She must never hear the rattling of instruments, and it is well to train the operating team to keep their peace while the anaesthetic is being administered. Witticisms and laughter are best tabooed, for it is serious business to the patient, this being operated upon, and she does not want her case considered in a light-hearted way. Equally important, a discussion of her case is not wise, for she may be able to hear even though she cannot talk, and be badly frightened by having certain details of her case discussed which have not been gone over with her. The writer knows of an instance where the surgeon, believing the patient to be asleep said to his assistant: "We will first explore the gall bladder, and if we don't find the stone we will turn him over and look at the kidney." "No", said the patient, who was not asleep, "some other surgeon who knows what he is going to find shall operate upon me.!"

The anaesthetist is the most valuable member of the operating team, and if properly trained and with the right personality, can do more to rob the surgical patient's mind of fear than any one else.

Can anyone witness the successful anaesthetizing of young children and see child after child put to sleep without crying, without struggling, without fright, and not admire the great skill that is being shown in suggestion and hypnotism; and, after seeing a screaming, struggling child asphyxiated by a poor anaesthetist, who of us is in the position to say just how much or of what type of future mental ill health may have its origin in the fright caused by this bad anaesthesia?

It is important to have the patient recover quietly from the anaesthetic in a recovery room. She must be administered to by a nurse who has been specially trained and who will assure her that the operation has been successfully performed and that her condition is excellent. Quiet, calm assurance at this time that everything is as it should be works better than seda-

tives, although it is essential that immediate post-operative suffering be controlled by morphine. We give frequent small doses of morphine for the first two days, and large amounts of fluids by mouth and rectum soon after operation. Everything possible is done for the comfort of these patients. After operation nurses are with them constantly and they have frequent visits from the surgical staff. The apprehensive patient who is allowed to suffer cannot be convinced that her condition is satisfactory—it is far from being so to her—and she fears an unsatisfactory or fatal outcome. The services of a corps of efficient, loyal, well-trained nurses, who love their work and who look upon it as an art and not a trade, at this time are indispensable.

The convalescent period of the successful surgical patient is short and certain. If there is good morale in the hospital, and in the ward particularly, the patient will be carried along on the tide of optimism and a feeling of security. The surgeon must come in close contact with his patients for he knows that he need not be feared in order to get his full quota of respect. Too much etiquette and ceremony during rounds do not encourage the friendly association that the chief ought to have with his convalescent patients.

All surgical patients must be examined by the surgeon or his associate when they are ready to leave the hospital. At this time the patient's disease or operation should be explained to her in detail, all final instructions for her after-care should be carefully given her, besides telling her that her home physician will be written to about her case. This gives her a sense of security at home and the request that she write back a report of herself from time to time is met with delight, for she feels that the interest shown in her will not come to an end when she leaves.

The surgeon cannot rely upon his operating skill alone for his full measure of success for it is necessary to give himself freely to his patients at all times. They need to be comforted, assured, and bolstered up for the trying ordeals they are about to undergo. The surgeon's optimism must be contagious—his coworkers must all be infected by it and his organization trained in practical psychology if the patient's mind is to be freed from the harmful emotions of fear, apprehension, doubt, and worry.

Little touches of human kindness—strict and constant attention to the patient's mental welfare will do much to rob our hospitals of their cold institutional atmospheres, which frighten so many of our diffident patients, and often interfere with many a satisfactory recovery.

X-Ray Diagnosis after Pelvic Inflation.—Van Zwaluwenburg, in a paper published posthumously (*Journ. of Radiology*, March, 1922), states that, apart from the demonstration of the patency of the tubes in sterility, the most valuable contribution of gaseous pelvic inflation (followed by X-ray examination) to gynæcological diagnosis consists in the exclusion of organic lesions in young subjects suffering from dysmenorrhœa and neuroses: the method is singularly successful in the detection of slight changes in the morphology and relationships of the pelvic organs, and it is fairly safe to conclude that the pelvis which appears normal after use of the method in question, is in fact without significant pathology and does not require operative exploration. For X-ray examination of the pelvis inflated with the gas the writer suggests the name "pelycography": pelycography, he says, will usually permit the diagnosis of pregnancy after the sixth week; it may lead to the exclusion of ectopic pregnancy, but owing to the early appearance of secondary changes is of little assistance in establishing such a condition. Van Zwaluwenburg has used this method in 350 cases without untoward result. It appears that in America 3,000 to 4,000 patients have been subjected to this method of examination with five recorded fatalities, of which one was due to puncture of the spleen and another occurred in a septic case. It is said that after gaseous inflation of the peritoneal cavity distinction between renal and splenic tumours by X-ray examination is particularly facilitated.—*Brit. Med. Jour.*, April 22nd 1922.

THE VALUE OF THE WASSERMANN*

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IT is some fifteen years since the Wassermann test was discovered. Its use is now world-wide. Laboratories are to-day carrying out ten times as many such tests as they were a few years ago. The value of the test has become of wide-spread interest to the physician, the patient, and the public.

This value is to-day a much discussed subject, both by the qualified and the unqualified. Let us consider for a moment the reasons which give rise to any question of its value. First; its value to the physician. Ever is it the wish of the physician to have medicine an exact science. A test of the blood is discovered which may indicate that the patient has syphilis. The physician sends a specimen of blood to the laboratory and desires that a positive or negativ report settle the question of syphilis as far as that patient is concerned.

Unfortunately, this is just what the laboratory can not do, and may I state this principle now—a principle we must carry in our mind during the discussion of this va ue:—the Wassermann test, like practically all other laboratory tests, is only a symptom of a disease, the finding to be used by the physician in correlation with all other symptoms in his judgment of the case. It is, however, the province of the physician to know the value of this one symptom for the report has a far reaching significance in all its phases.

What is this value? The investigations of many able workers, with exact technique and with close relationship between the laboratory and the clinical case, show that untreated, definite clinical cases of syphilis give a positive Wassermann as follows:—

In primary syphilis, 30% at end of first week up to 80% in the fifth week. (1) In secondary syphilis, 96 to 100%. I have never seen an untreated case of syphilis with a rash or mucous patches in the mouth that did not give a positive Wassermann. However, negative results have been reported in a few cases of malignant syphilis. In tertiary syphilis, 85 to 90% of cases show a positive reaction. In congenital syphilis, 100% at birth, decreasing to 85% in adult life. The cerebro-spinal fluid does not show as high a percentage; even in the presence of neuro-syphilis only 60% of the cerebro-spinal fluid is found positive.

The relation of the positive test in the blood to the clinical case is then indeed one of great accuracy and high value. (2) (3). Does then a positive test indicate only syphilis? Numerous investigators, with varied technique, have claimed that positive reactions were obtained in tuberculosis, scarlatina and in fact, in nearly every known disease of the human race. Extensive work, however, by painstaking investigators shows that these conditions do not give a positive Wassermann, and that there is little or no reaction in any disease, with the possible exception of yaws and leprosy, and sometimes in blood collected at the height of a febrile attack. In this connection it is well to note that according to able syphilographers, from 5 to 8% of our population is syphilitic. Now syphilitics may and do have other diseases—scarlatina, tuberculosis, skin or mental diseases—the dominant symptoms are of these diseases, and such patients may and do have positive Wassermanns. To recognize these conditions is the duty of the clinician.

After a personal experience of a dozen of years with Wassermann tests, in which I have had the opportunity to see many of the patients, I am impressed on the one hand with its clinical accuracy and on the other with its numerous pitfalls. It is because of the latter that there is a difficulty in judging the true value of the test, and these pitfalls have subjected the test to extensive criticism.

I shall discuss these as briefly as possible, without going into the complicated technique of the reaction, under the following heads.

1.—Variations in the patient.

2.—Collection of the specimen.

*Read before the Winnipeg Medical Society, December 21st, 1921.

3.—The report and its interpretation.
4.—The technique of the laboratory.

First—Variations in the Patient

Using the same technique and reagents, some patient's serum varies in its reaction from week to week. Syphilis may vary in its symptoms from week to week with and without treatment; the Wassermann test may follow these periods of the disease.

Blood taken at the height of a febrile attack may give a slight positive reaction (4); also blood taken during anesthesia. It is also claimed by some observers (5) that the injection of salvarsan will produce a positive reaction in 30% of normal individuals. Alcohol has the opposite effect; in 20% of positive cases 24 hours after taking alcohol they become negative This does not apply to gin. (6)

Second—The Collection of the Specimen

Herein is a great source of error. I consider that 15% of the specimens we receive in our laboratory will not give accurate results. The reasons are that the specimens have been infected with bacteria and chemicals, or are hemolyzed. The Wassermann reaction is exceedingly sensitive, the slightest trace of any chemical is often sufficient to change the result. Bacteria, water, and infected glassware affect the reaction. Hemolysis is sometimes caused by taking the blood with a syringe; excessive force in drawing and expelling the blood injures the corpuscles. Freezing and shaking cause hemolysis. Messenger boys have the habit of bringing in a specimen on the front of a bicycle; in winter they arrive frozen; in summer hemolyzed. We receive Wassermanns in a variety of containers, infected, hemolyzed and frozen; with cotton plugs which have absorbed the serum, or corks impregnated with chemicals. Blood should be collected in a sterile container such as a Keidel tube, sloped and set aside immediately to clot; after clotting it is correctly labelled, and placed in the icechest. The serum is then removed within 12 hours. The labelling gives rise to a frequent error; it is a clerical error. Some institutions and physicians send in specimens numbered; the number corresponding to a name; numbering and labelling the specimen is often left in the hands of clerks and technicians. Specimens are collected in groups; all bloods look alike, and it is but a specimen of blood. Do physicians consider the correct collection, labelling, and transmission of a specimen of blood for the Wassermann test seriously enough?

Third—The Report

Most laboratories adopt the method of Citron, namely, negative, doubtful, one, two, three, and four plus positive. These degrees depend upon the amount of complement fixed, as judged by each individual observer. Some laboratories also report the reaction as obtained with the different antigens, such as cholestrinized, acetone, etc. The physician to-day has enough knowledge to assimilate without being forced to judge the value of these reagents, surely the laboratory should be the best judge of the value of its own antigens, and so report the test positive or negative to the general practitioner. No two antigens are alike and any laboratory is able to prepare antigen so sensitive as to pick up many false positives. Such a complicated method of reporting may arise from tests being carried out by technicians unacquainted with the relation of that particular reaction to the clinical case: or may be rightly used by the laboratory, the reports of which are only received by the specialist.

The Interpretation of the Report

A negative report means:—1.—That the patient never had syphilis. 2.—Is serologically negative after treatment. 3.—That the case is latent. 4.—Because of some peculiarity in the elaboration of antibodies, the test fails to be positive. A doubtful reaction is one in which there is from 10 to 15% inhibition of complement. Such reactions frequently follow treatment; they are also to be found in the early stage of the disease, and are sometimes due to imperfection in the specimen or the technique. For diagnosis, such reaction calls for further tests. A one plus positive is a reaction which is 25% positive. This reaction also occurs frequently during treatment and in the primary period of the disease. The physician should consider such a finding with caution and repeat the test if doubtful of other symptoms. A two plus Wassermann is 50% positive; a three plus 75%; and a four plus 100% positive. With assured technique such reactions in this country are indicative of syphilis. In latent syphilis the reaction of the cerebro-spinal fluid is sometimes positive when the blood is negative. It is to

be noted that in every stage of syphilis there are a few cases which will not respond to the Wassermann test in the presence of clinical symptoms. A negative test then does not absolutely exclude syphilis.

The Value of the Test in Treatment

In over 90% of the cases treatment changes the reaction from positive to negative. However, there is now abundant evidence to show that the test may again become positive after a period of rest. It is safe to assume, therefore, that a negative test fairly early after treatment indicates inactivity rather than cure.

Again, after most intensive treatment about 10% of the patients remain so-called "Wassermann fast cases"—the Wassermann remains positive. We have tested in our laboratory one patient's serum 32 times over a period of several years, and it has always remained fully positive. This condition is an indication for careful clinical investigation. (7)

In some cases of clinical syphilis with a negative Wassermann, the Wassermann has become positive after an injection of salvarsan. This gives rise to the so-called provocative Wassermann reaction (8); a reaction that must be held in doubt until further proof is obtained as to the effect of salvarsan on normal individuals. (9)

In considering the reaction as a criterion of cure, caution must be observed. A negative reaction does not necessarily indicate a cure although it is an indication of the effect of treatment. Certainly clinical symptoms do not progress with a steadily decreasing positive Wassermann. Some persons receive and use a negative report as a certificate for a life time. Such persons may have syphilis; may have been treated, and may have manifestations return later; or such persons may subsequently contract the disease.

On the other hand, a persistently positive Wassermann can hardly be considered to indicate persistent drastic treatment (10) (11); the future alone will show what a persistent Wassermann means as to prognosis. It is wise for any syphilitic patient to have examinations repeated every six months for a period extending over years. Prolonged observation, clinical and serologic, supplies the test indicative of a cure, and a cure can at present be construed only as the absence of those symptoms detectable at the time to the physician's senses. (12)

What is the value of the test in answering that difficult question, may the patient marry? One would indeed hesitate to advise 'yes' to such a person if the test remained positive; only may marriage be permitted when the Wassermann is found negative over a prolonged period, and there is a complete absence of clinical symptoms.

The Technique of the Test

It is not my purpose here to burden you with all the ramifications of the technique of the test. In spite of modifications the classical Wassermann at present remains as the most widely used diagnostic laboratory test of syphilis. It is a biological test, and the reasons for the reaction are only partly understood. If carried out accurately it is the most complicated and difficult of all laboratory work, requiring constant supervision, and when left in the hands of a technician whose observation is limited to the test tube, it loses its value. There is at present no standard method of performing it, although extensive investigations along this line are being carried out. (13) The best standardization that exists to-day is the length of experience of any one observer with a certain technique, checked by clinical observation. Reactions vary with the amboceptors, serums, complement, time and method of incubation and the antigens. (14). I have found it necessary to select the latter with great care. A heart selected for antigen from a man or animal suffering from tuberculosis or other disease will sometimes give a slight reaction to the blood of persons suffering from these diseases; in other words a false positive.

I have endeavoured to give the individual value and pitfalls of the test as briefly as possible. Some of these pitfalls are avoidable; others are not. A higher perfection of technique and a better understanding on the part of the physician will enhance the value of the test.

A word as to the general value. The Wassermann test, more than any other feature has focused the attention of the world on syphilis. We may now for the first time look for the check and the possible elimination of this, the most wide-spread and insidious of all diseases. It is now used by the state in jails, detention homes, and such institutions, and serves as a lever to insist on the treatment of those cases that do most to spread the disease. The great difficulty in any former attempt to control the disease was to locate and treat those most responsible for

its spread. Recently Professor Williams (15) of Johns Hopkins, carried out a series of 4,577 tests on pregnant women admitted to the hospital, 421 gave a positive Wassermann. In those receiving satisfactory treatment the results were remarkable compared to the untreated cases. If that is the result in one hospital, what may be done over the world? The test was used in our army to check the cases before return to civil life; those cases with a positive test were treated, and treated excellently; without this test they would have been discharged and become a menace to the population. If prevention is our ideal, then indeed the Wassermann test is of high value.

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THE EFFECTS OF GENERAL ANAESTHETICS ON THE LIVER

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History

IT was only a few years after the discovery of ether and chloroform that death was noted to take place after a general anæsthetic had been administered. In fact, it was in 1850 that Casper published cases of death occurring several days after the narcosis and the same year, Von Langenback reported a case of death after seventeen hours, and discovered that the liver was filled with fat. It has been an established fact, therefore, for as long as anæsthetics have been used, that accidents will occur at a more or less distant interval after anæsthesia, and also that there is some relation to the hepatic lesions found.

Nothnagel, Ungar and Junkers have proved by experiments the importance of the hepatic steatose. Paul Bert in 1885 found the same lesions and also discovered pigments of bile and urobilin in the urine. Later, Thum, Fisher, Chiarleoni, and Cohn describe serious forms of "icterus post anæsthetic," while De Bovis in 1903 makes mention of a mild form of the same icterus.

Bastianelli in 1891, Frænkel in 1892, Bauder in 1896 and Aubertin in 1906 studied the histology of these same lesions.

Since that time, Aubertin, Quenu, Chevrier, Brule and Benard have made known certain points of the clinical history of the post-anæsthetic icterus.

Pathological Anatomy

The anatomical lesions of the chloroformed liver are now very well known and have been demonstrated by animal experimentation. It is true that the lesions thus discovered are not always in proportion to the duration of narcosis. For instance, Aubertin, after having chloroformed a rabbit for half an hour during thirteen consecutive days, could ascertain but very minimal lesions such as congestion with considerable enlargement of the capillaries, especially around the central vein, and a very slight, barely perceptible infiltration of fat. On the other hand, animals dead from two to four days after anæsthesia without having presented any symptoms of

icterus and after only a single anæsthesia, showed a general degeneration, hæmorrhages, steatosis and occasionally a total necrosis of the liver.

Serious cases of icterus leading to death of human beings, showed lesions varying from the first stage of fatty degeneration to that of complete cell necrosis.

Fiessinger and Montaz detail a case in which the autopsy revealed a nutmeg-like liver and in which the lesions consisted of an intense degeneration of the whole of the centre of the lobules; the hepatic cells had nearly disappeared and there was pronounced fatty degeneration around the spaces of Kiernan.

Clinical Study—Chloroform

Benard notes three different forms of this affection; (a) the serious; (b) the mild; (c) the form without clinical symptoms.

(a) The serious form is recognized as appearing in two different forms; the nervous type and the serious icteric type:

1.—The nervous, in which the predominating symptoms are convulsions and delirium, differing considerably in degree of intensity; vomiting is early, violent and frequent. Micturition is infrequent, the urine dark and containing pigments of bile, urobilin and albumen. Death may result from the third to the seventh day.

2.—The serious icteric type is characterized by the early appearance of jaundice which dominates the whole case. The nervous symptoms appear only towards the end.

(b) The mild form is distinguished from the foregoing by its symptoms being much less serious, and by its resolution within a few days.

(c) The third form known by the French, as the "forme fruste" is that in which the clinical course is reduced to a minimum. The patient has no pains nor trouble, displays no coloring of the teguments. On the contrary a study of the blood, by its colour and by a study of the pigments, enabled Benard, Chevrier and Sorrel to establish the following laws:

1.—The cholæmia is constant.—It is found in 93 cases out of 93 anæsthesias. All subjects chloroformed become cholæmic and the icterus whether mild or strong is only a more accentuated modification of a constant phenomenon.

2.—This cholæmia is immediate.—It starts even during the operation and attains to a high degree as early as eight hours after the start of anæsthesia.

3.—It is cyclical.—It increases during the first thirty-six hours and reaches its maximum during the second day to disappear little by little, lasting at times from eight to eleven days.

Ether

There is no clinical history of a case of hepatic lesions caused by ether. It is probably on this account, that a number of authors for a long time were convinced that ether had no noticeable effect on the liver.

In 1910, Rathery and Saison ascertained by experiments that hepatic and renal lesions produced by the use of ether were as frequent and probably as severe as those caused by chloroform. The histological lesions are analogous, with, in addition, hæmorrhagic lesions, of very pronounced character. Brule, Garban and Le Gal LaSalle have found hepatic troubles just as frequently with ether as with chloroform.

In 1919, Chevrier published statistics of 38 cases of cholæmia in 38 cases of anæsthesia with ether. On the other hand, Brule and his associates report that on 15 anæsthesias with chloroform, in 12 cases there was a severe retention of bilious elements, in 2 cases, a mild retention and but a single instance where there was no retention, also that out of 33 anæsthesias with ether, there had been 22 severe retentions—6 mild and 5 void. Therefore they concluded that ether did not seem much less poisonous than chloroform for the liver. Making a comparison of the cholæmia of ether with that of chloroform, Chevrier noted slight differences, particularly the quicker action of ether and its shorter duration.

Nitrous Oxide

Since nitrous oxide has been in current use only a few years, it has not as yet afforded occasion for many experimental or scientific researches.

Following the experiments of Chevrier on the action of ether and chloroform on the liver, we have made the same tests to determine the effects of nitrous oxide on the liver.

We have systematically looked for the presence of urobilin and bilious pigments in a series of patients before surgical interference, as well as on the second and fifth days after surgical intervention. This series of patients was put into two different classes, one in which the anæsthesia caused by nitrous oxide had been sufficient to allow for surgical work and the other those in

which it had been necessary to make use of a small quantity of ether.

In the first group of these patients, approximately eighty per cent. of the cases showed no traces of urobilin and where there were slight signs of it, it had completely disappeared within forty-eight hours; twenty per cent. only, retained any traces of it for more than five days. As to the biliary salts only twenty per cent. displayed any traces of same, this however, had totally disappeared after forty-eight hours.

In the second class of these patients, transient urobilin was noted in only twenty per cent. of the cases. As to biliary pigments, these were found only in the same proportion.

At the same time that we were making these researches, Desmarais and Lascombes, in France, were doing the same there, and got results which were more than ever in favour of anæsthesia with nitrous oxide. In no case did they discover, after anæsthesia with nitrous oxide, the presence of urobilin or biliary pigments in the urine of their patients. It must be noted, however, that the patients on whom they experimented, had been subjected to no surgical intervention, whatever. The anæsthetic had been used in these cases, either tc permit of a too painful examination or of the application of a plaster cast.

It is important to note this pcint, since cholæmia may also be produced by the operation, as we will have occasion to see when studying the pathogenesis of the effects of general anæsthetics on the liver.

Pathogenesis

Following these researches, it would appear that the pathogenesis of the post-anæsthetic icterus would be simple. It would seem to be only a matter of the intoxication of the hepatic cell and consequently an icterus of hepatic origin. However, this question has given rise to discussions. Quenu and Kuss were the first to submit the hypothesis of a hematogenous icterus, by concluding for instance, that chloroform which is poisonous in vitro to the red corpuscles could also determine "laking" in the blood circulation. Gilbert, Chabrol, Weill have also been of this opinion.

Benard disagreed with this way of thinking. In studying the globular resistance to the saline solutions in cases of cholæmia, after chloroform, without icterus, he observed two different reactions of the cells, hyporesistance and hyperresistance. When hyporesistance manifested itself, it came as early as the first day, to become normal again on the fourth day, while in cases of hyperresistance, appearing later, it would not reach its maximum before the fifth or seventh day. The absence of granular degeneration in red cells, when considering the severe and transitory character of the hyporesistance, could easily make him doubt the possibility of an icterus of hæmatogenous origin. The later researches of Brule, proved the logic of Benard's theory. The frequent retentions, more or less severe, of pigments and biliary salts, prove that if icterus of hæmatogenous origin existed, it was in exceptional cases.

However, Quenu, Duval and Brule, also explained this hyporesistance of the red cells in the following manner: All operations, they said, were accompanied by effusions of blood in the system, therefore the re-absorption of the blood can determine a local hæmo-biligenic process, resulting in cholæmia. It is to a similar phenomenon, that we must attribute a consecutive icterus in a case of radical cure of hernia performed by Reclus with a local anæsthetic.

Through what mechanism are general anæsthetics poisonous to the liver? Evarts A. Graham attributes it to a certain dose of asphyxia, which is produced by a lessening of oxidation and by acid intoxication. If chloroform is more poisonous than other anæsthetics it is on account of its decomposition into hydrochloric acid which increases the acid intoxication, hence fatty degeneration of the hepatic cells, necrosis and hæmorrhagic processes. On the other hand, Davis and Whipple, after their experiments cannot attribute the poisons in anæsthetics to asphyxia of the tissues and have in no case noticed the protection afforded by alkalines.

Conclusions

1.—The use of ether and chloroform produce a cholæmia of same length and to the same degree.

2.—Nitrous oxide used on patients requiring no surgical intervention, produces no cholæmia and is the only anæsthetic which does not injure the hepatic cell.

3.—Nitrous oxide reduces considerably the frequence, length and intensity of the cholæmia in persons who were operated upon.

4.—Administered together with ether, nitrous oxide and oxygen reduce considerably the cholæmia and the length of same, when compared with the effects of ether alone.

5.—According to Desmarest and Lascombes, knowing that anæsthesia produced by nitrous oxide and oxygen alone cannot modify the degree and frequency of cholæmia, it is possible to establish the place that the traumatism of the operation takes and they even go as far as to say that if the post-anæsthetic cholæmia is nil, the post-operative cholæmia is all the more severe according to the nature of the traumatism produced by the operation.

6.—Nitrous oxide and oxygen is therefore the anæsthetic to be used on all persons who have hepatic lesions, in cases of intervention on the biliary tract and on patients whose general condition is seriously affected.

Treatment

It is evident that there is nothing particular about the treatment, it is the ordinary treatment for toxic icterus, according to symptoms. It is to prophylactic means that we must resort.

But how can we prevent, at the time, the very noticeable action that anæsthetics have on the liver, or at least how can we limit these effects?

The choice of the anæsthetic is the most important point, in prophylactic treatment. Since nitrous oxide and oxygen has no effect, or hardly any, on the liver, we should therefore use this anæsthetic as often as it is possible to do so.

Davis and Whipple have proved that fasting and fats favour chloroform intoxication. On the other hand, they found that sugar, carbohydrates, skimmed milk, and casein are good preventatives thereof.

Certain chemical agents also have properties which enable the system to make use of its own powers of resistance. For instance, quinine and adrenalin in causing an increase of glycogen have good results. Chevrier, in France, also determined that cholæmia is considerably lessened if the patient is given on the previous day or even on the morning of the operation, 150 grams of syrup of sugar. The effects of this sugar are rendered more beneficial, if after the operation a glucose injection is given. He also found that liver extracts administered the day before, produced satisfactory results. Consequently, the combination of the two systems, that of sugar and the hepatic opotherapy may lead to the disappearance of cholæmia.

Before closing, it would be well to call to your attention the fact that we are doing away more and more with long fasts and strong laxatives. These innovations, although of recent date, have already been of great help in the struggle against unsatisfactory effects which general anæsthetics have on the liver.

Function of the Colostrum.—The blood of new-born infants, and probably of all other mammals, contains little or none of the serum protein or protein fraction known as the euglobulin. This seems to be supplied chiefly by the colostrum, which differs from milk in containing a large amount of this protein secreted directly from the blood. The euglobulin is the only blood protein that appears in the colostrum, and it is the only protein fraction in which the new-born infants' blood is deficient. It is suggested by Julian H. Lewis and H. Gideon Wells, Chicago, evidently the colostrum is formed to provide the fetus with a supply of euglobulin for its blood, during the short period immediately after birth, when proteins may be best absorbed without disintegration by digestive protelysis. The importance of this lies in the fact that the protective antibodies of the blood are found associated with the euglobulin fraction, and that the quantity of protective antibodies found in the colostrum, the milk and the infant's blood varies directly with the euglobulin content of these fluids. Evidently the colostrum furnishes to the new-born mammal protective antibodies, which probably add much to its capacity to resist infection in early life. If the infant does not receive colostrum it requires euglobulin in its blood much more slowly, and presumably is in corresponding degree less resistant to infection. It is not probable that there is any equivalent substitute for human colostrum for new-born infants. The findings of numerous recent workers reviewed by Lewis and Wells add force to the statements made by Famulener, ten years ago, that it is most highly desirable that every new-born infant should receive its full ration of human colostrum.—*Jour. A. M. A.*, March 25, 1922.

REPORT OF A CASE OF BROMIDE ERUPTION IN A NURSING INFANT*

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WE have known for some time that certain drugs given to a nursing mother are excreted in the breast milk, though usually in such small quantities that there is no effect on the baby; we fail to realize, however, that certain drugs, principally bromide and diarsenol preparations may be excreted in sufficient quantities to poison the infant. Such cases come to light from time to time.

Dunn believes that some drugs are excreted in breast milk but not in sufficient quantities to do harm. Salvarsan, however, may be excreted in quantities large enough to cause death of infant.

Grulee (2) says that given in physiological doses very few drugs are excreted in the breast milk, but given in poisonous doses many are.

Garrod, Batten and Thursfield (3) believe that drugs taken by nursing mothers may be partly excreted in the milk and may affect the child.

Morse and Talbot (4) say that some drugs are excreted in the breast milk, but only in traces.

Chapin and Pisek (5) believe great care must be taken in giving drugs to nursing mothers as they may be excreted in the breast milk.

Holt (6) mentions the elimination of drugs in breast milk and says that few of those popularly supposed to affect the child through the mother do so, but states that iodides and bromides are excreted in sufficient quantities to produce their constitutional effects in the child.

Still (7) speaks of the excretion of drugs in the breast milk and the possibility of making the breast milk disagreeable to the child, and says that the less drugs a nursing mother takes the safer for the child.

REPORT OF CASE

C. W.—Age, 6 months. Admitted to wards of the Hospital for Sick Children, March 22, 1921.
Complaint—Eruption, 3 weeks.
Family History—Mother nervous, rundown. Had been taking following tonic for 7½ weeks.
Sodii bromide—6 drams.
Liq. Ferri Cum Quininax.
Liq. Ferri Cum Quininax et Strychnina ad 8 ounces 2 drams. T.I.D. P.C.
Feeding History—Nursed since birth.
Previous illness—None.

Present Illness.—Three weeks previous to admission, mother had noticed two or three pustules on cheek and head. They had rapidly increased in number and appeared on buttocks and legs. They were never itchy and child's general health appeared good.

Examination.—Well developed well nourished, male child of about six months of age, who did not appear ill or irritable.

Skin: There was an eruption present on face, scalp, buttocks and legs.

Lesions were raised, crusted, squamous and granulomatous.

Patches varied in size from 1 to 2 cms. with well defined margins and an area of erythema around them. A few larger patches showed secondary pustules. These pustules on pressure exuded a sero-purulent discharge.

Other systems appeared normal.

Clinical Laboratory Findings

Urine, Negative. R.B.C. 6,400,000. Haem. 100 percent
W.B.C. 14,200 Polys. 38 percent
Lymph. 60 percent
Eos. 2 percent
Wassermann—Negative.
Tuberculin tests—2
Intracutaneous—Negative
Von Pirquet—Negative
Treatment—Mother's tonic discontinued.

Progress.—Eruption underwent a gradual disappearance. In about two weeks time pustules had disappeared and crusts were commencing to separate. Child was discharged to return to Out-patient Department where he was kept under observation. He continued to improve and six weeks after mother's tonic was discontinued all the crusts had separated.

Discussion.—In this case we have a nursing baby six months of age, receiving sufficient

*From the wards of the Hospital for Sick Children, Toronto, Ontario, July, 1921.

bromides through the mother's milk to produce marked cutaneous signs of bromide poisoning. The mother was receiving forty-five grains of sodium bromide per day, over a period of seven and a half weeks. Not until four and a half weeks after bromides were started did the first symptoms of intolerance appear in the baby.

FIG. 1.—Showing distribution and character of eruption face and head.

The mother never developed any eruption.

When the tonic was discontinued, the baby's condition showed a steady but gradual improvement.

Van der Bogert (8) reports a case of bromide poisoning from mother's milk following the use by the mother of a tonic which contained ammonium bromide 1.13 percent, potassium bromide 9.87 percent, sodium bromide 6.93 percent.

Stelwagon (9) mentions appearance of bromide eruption in nursing babies where mother has been taking bromides, even where mother is free from an eruption. He states that the eruption persists for several weeks after the drug is discontinued.

Sequeira (10) observed bromide eruption in nursing infants, following use of bromides by mother. He noted that when eruption first appeared it resembled varicella, but that pustules did not dry up but ran together forming confluent patches which increased in size and ultimately suppurated. He states that the characteristic lesions are flat, slightly elevated with brownish crusts and a zone of erythema.

FIG. 2.—Showing distribution and character of eruption on legs

I am indebted to Dr. Alan Brown, Physician-in-chief for permission to report this case.

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Foreign Hospitals

THE PARIS MEDICAL SCHOOL

ITS HOSPITALS
THE MEDICAL CURRICULUM
POST-GRADUATE WORK

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WHAT are the clinical facilities offered for post graduate work in Paris, and what are the special features, if any, of the Paris Medical School? Such are the questions I have been asked to answer for the readers of the *Canadian Medical Journal*. The questions are timely, since travelling facilities are becoming normal in the Allied Countries, and Paris, as well as London and Edinburgh, offers ample and varied opportunities for practical post-graduate work. These lines will be supplementary to the excellent notes given in the January number of our *Journal* by Dr. G. R. D. Farmer and will bear on : A. The Hospitals and their staff. B. The Medical Curriculum. C. Post-Graduate work.

I.—Hospitals and Staffs

The 35 and more public hospitals of Paris all belong to the municipality, which is solely responsible for their upkeep as well as for the recruiting of their staffs. Let us recall the names of the most important of them, familiar to the student of medical history no less than to the visitor; the Hotel-Dieu and St. Louis, La Charité and La Pitie, Cochin and Broca, La Salpetriere and Necker, Baudelocque and Tarnier, Quinze-Vingt and Lariboisiere, etc. As for the staff—no appointment is made through influence or wire-pulling; exclusively by "concours." There are seven sections: medicine, surgery, obstetrics, neurology, oto-laryngology, ophthalmology and dentistry. The younger men chosen by the jury get the services of the outlying districts to begin with and it is up to them by their increasing reputation as well as maturing years to gradually work up to the better services in the centrally located hospitals. The system works well and brings to the front by natural selection the most capable men.

II.—The Medical Curriculum

Between 450 and 500 medical students register annually for their first year at Paris; the total of medical students, including men and women, French and foreign, numbering more than 5,000. To be allowed to register as a student the beginner must not only be a B.A., but must also have his degree in P.C.N. (Physics, Chemistry and Nat. Sci.) which requires one pre-medical year of preparatory sciences. The B.A. degree is no small matter, requiring 7 to 8 years of secondary education: no curtailed or overlapping studies are permitted. The medical curriculum requires a minimum of 5 years, which are crowned by the presentation of a thesis before a jury. From the very start, his first year, the French student is assigned to hospital work, and this is how the day's work is mapped out: 9 to 11.30: practical hospital work; 1.30 to 4 or 5: laboratory work; 4 to 6 or 7: theoretical lectures, attendance on which is optional.

The assistants in the different services are externes, internes and chefs de Clinique, under the direction of the Chef de Service or Professor. These positions are obtained only through competitive examinations: l'Externat being possibly obtained at the end of the second year. As for l'Internat, this position is most ardently coveted and competed for, as it carries with it lodgings and a small salary and is for five years; for the 60 to 75 yearly vacancies, some 250 to 300 candidates undergo the examinations which are both written and oral.

And so gradually as those chosen work their way up to Chef de Clinique and still higher, a Professorship is only attainable after years of preparation and selective competitions. To one conversant with the French training and medical literature and who has followed the bedside and amphitheatre teaching in Paris, it is no wonder, bearing in mind this long and practical training, that the French clinician is not only a master at exposition but also a capable research worker. To the clearness of conception he brings the talent of exposition, as Osler remarks, and as Wm. Mayo recently wrote: "that intuitive clarity of thought and facile mastery of technic which we associate, and rightly, with the French and Italian schools."

So the medical student in France attends the hospital from the very start and has thus an early opportunity of getting in contact with the patient. And all through his five years he will have to be in daily attendance in the hospital wards and laboratories from 9 to 11.30. His duties are similar to those of "clinical clerk" and "surgical dresser" in the London hospitals. This hospital and bedside coaching is very similar to that received in London and Edinburgh, where small group ward teaching has always been preferred. It stands in absolute contrast to the German method, which favours amphitheatre and large class teaching, unless one takes private lessons from a privat-docent. I never could understand how part of the medical world ever went mad in ecstatic admiration for "this distant and far away from the patient" German method.

III.—Post-Graduate Work

As for this special line of study, Paris offers great and varied opportunities. We all know of the excellent original work which has been carried on in the services of the following professors, who are always glad to welcome new workers in their hospitals.

In *General Medicine:* Professor Chauffard teaches at St. Antoine, Widal at Cochin, Gilbert at the Hotel-Dieu, Sergent at La Charité, Bernard at Laenec, Vaquez at La Pitié, Pierre-Marie at La Salpétriere. In *Surgery,* there are Professor Hartman, Legueu, Delbet, Gosset, Duval, Sebileau, Marion, Cuneo, Heitz-Boyer, Rieffel, Lecene, Dujarrier, de Martel, etc. In *Gynecology:* Faure. In *Orthopedics:* Broca and Ombredane. In *Obstetrics:* Coulevaire, Bar, Potocki, Bouffe. In *Ophthalmology and Oto-Laryngology:* de Lapersonne, Lermoyez, Terrien, Rochon-Duvignau.

For the past year or so, the Faculty of Paris keeps open for citizens of the Allied Nations vacancies as "Internes" to be allocated to men recommended by their respective universities. The International University Bureau of Paris is the official agency through which such positions may be secured and the Canadian representative is Professor du Roure, of Montreal, working in connection with the French Consul, M. Naggiar.

In addition to these positions as "Internes" there are other facilities for advanced work in Paris. Every one knows that the Pasteur Institute under the present direction of Professor Calmette, offers twice a year an advanced and essentially practical course in Bacteriology; also keeping open every department to those desirous of pursuing research work. Last summer I found there a large number of Japanese and Chinese men who had been engaged in research studies for some months. At *La Salpetriere* with its 3,500 beds Professor Pierre-Marie, the earnest successor of Dejerine, will welcome any student desirous of improving his knowledge in Neuropathology. *St. Louis Hospital* with its 1,200 beds, is devoted specially to Skin and Syphilitic Diseases, and every morning the physicians in its outdoor department attend to 250 to 300 applicants. *The Necker Hospital and Terrace* is known to every G-U. specialist. To the *Obstetrician,* the clinics of Baudelocque and Tarnier and the services of Professor Coulevaire, Bar, Potocki and Bouffe offer unrivalled facilities for personal work; some 75 students from Edinburgh University are at present enrolled. In *Ophthalmology and Oto-Laryngology,* I would point to the services of Professor de Lapersonne, Terrien, Rochon-Duvignaud, Luc, Abadie, Guisez. To those interested in special surgery, one will find a ready welcome by Professors Hartmann and Gosset (gastro-intestinal tube); Faure (gynecology); Legueu, Marion, Heitz-Boyer (G-U); Sebileau (goitre); de Martel (cranial); Broca and Ombredane (orthopedics); whilst Delbet, Duval, Cuneo, Proust, Tuffier and Pauchet, Lecenne, Rieffel, Legars, Dujarrier and a host of others welcome the visitor, properly introduced, to their services of general surgery.

Moreover, at different times in the year there are given in the most important clinical services, series of special courses, essentially practical and consisting of clinical demonstrations and laboratory work by the whole staff of these professorial units.

May I mention some of them at random taking place this year:

In Medicine

Professor Gilbert, Hotel-Dieu, April.—A special course on recent medico-surgical ideas, on diseases of the liver and pancreas; July, 1 dem: gastro-intestinal tube; September, laboratory methods for general purposes.

Professor Chauffard, Hopital St. Antoine.—June, special course, 20 lessons, 150 frs, on diseases of liver, pancreas, gout and diabetes.

Professor Widal. Hopital Cochin, June.—6 lessons on renal diseases; 4 lessons on liver diseases; 6 lessons on blood and serology.

Professor Vaquez, Hopital La Pitié, July.—

Special course on diseases of the heart and blood vessels.

Professor Sergent, Hopital La Charit', June and July.—I. Applied Therapeutics; II. "Cours de perfectionnement" on pulmonary tuberculosis.

In Surgery

Professor Delbet, Hopital Cochin, April.—Luxations and fractures.

Professor Hartman, Hotel-Dieu, July.—Surgery of gastro-intestinal tract.

Professor Lejars, Hopital St. Antoine, July.—General principles of surgery.

Professor Broca and Renon, Hopital des Enfants Malades, July.—Combined medical and surgical courses on tuberculosis.

Professor Gosset, La Salpetriere Hopital, June and July.—15 lessons: abdominal surgery.

Professor. Duval, Hopital Vaugirard (new): 20 lessons on diseases of the gastro-intestinal tract, illustrated by operations. And the same will be followed in every department.

Suffice it to say that the Paris School has evolved a series of special courses—"Cours de Perfectionnement"—covering every department of medicine and surgery, which are given now in the spring and in September and October; in fact similar to the Ferien cursus we found in olden days in the German clinics. But for those familiar with the German and French methods through personal experience, these courses as given in Paris are superior to those in Germany. The clarity and facility of exposition, the abundance of material and the essentially practical side of these courses have made them very popular amongst French as well as foreign physicians. A few weeks visit to the Paris clinics in the spring and early summer is most fruitful. Nothing is so beneficial in our own medical field as to be cognizant of the advanced work of the important medical schools in Europe; and there are none better than the English and French schools.

It was my privilege, in attending the British Empire University Meeting in England, to visit anew the medical schools and hospitals of London and Edinburgh and of the leading provincial universities. Their organization is of the best and if some of them are striving for better, newer and larger quarters, let me say how we were impressed by the practical way in which the teaching was carried on and of its high order. International ways and methods seemed quite familiar to their leaders.

Let us signal out for our appreciation the interchange movement of medical ideas and methods between the Anglo-Scottish and French schools which is actually taking place. Only a few weeks ago 90 students (75 men and 16 women) from the Faculty of Edinburgh University were arriving in Paris for a special course in obstetrics. The men, divided in 2 groups, were in attendance every morning at Professor Coulevaire's clinic (Baudelocque) and Professor Bar's (Maternite Tarnier), whilst the women attended Professor Brindeau's service at La Pitié.

Still better, Professor Chauffard opened a series of 6 lectures to be given in London by leading men from Paris, whilst six of the most prominent London professors will lecture in the grand amphitheatre of the Faculty in Paris.

There is so much to be gained by such interchange of courtesies where science goes hand in hand with the amenities of life.

THE DE QUERVAIN CLINIC AT BERNE—SWITZERLAND

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At the DeQuervain Clinic, Insel Spital, Berne, the day begins with an hour given over to the presentation of new cases to the class in surgery. In addition to the new cases are old ones of interest in connection with whom microscopical slides, bacteriological preparations, post operative reports, etc., are shown. The cases are extremely well worked up and are presented by Professor de Quervain himself. The hour is essentially one of surgical diagnosis and, as the many readers of *"Special Surgical Diagnosis"* can easily imagine, is of utmost value.

The operating room is spacious and very well equipped and its smooth and efficient management are well worth study. Professor deQuervain has devised a number of instruments and apparatus. His operating room table and surgical instruments will be found instructive.

It is a mistake to assume that during the morning's work only goitre operations will be seen, for there is always a good variety of cases. However, the most interesting single phase of surgery at this clinic is, I believe, thyroid surgery. In a short time one sees a large number of thy-

roidectomies, the technique of which is beautiful. Professor de Quervain has ingeniously worked out by injecting colored gelatine into the fascial planes of the neck of cadavers, an extra capsular approach to the inferior thyroid artery. This approach is simple and rapid and the ligating is done on both sides at the outset in all cases as a means of primary hæmostasis. It is followed by ligation of either the superior thyroid artery on one side and the anterior branch of the superior thyroid on the other or of both anterior branches. After this preliminary primary hæmostasis the gland is resected—usually without any hæmorrhage whatever and the remaining portion oft he capsule is restored over the gland substance left. The thyroidectomies are done under local anæsthesia. An occasional case of acute thyroiditis or of some thyroid pathology particularly rare in America is to be seen, such as metastasis to bone from a thyroid which is as far as can be determined entirely normal. One sees numerous extremely large goitres, some plunging and some encircling the trachea. Nearly all goitre cases have lateral and anterior x-ray plates to show the relation of the goitre to the trachea.

Also of great special interest is the gastric surgery. Professor de Quervain has been comparing the results obtained by simple gastro-enterostomy in cases of gastric ulcer with the results obtained in similar cases by the so-called sleeve operation or anastomosis following excision of the ulcer with a circular band of stomach wall by means of two parallel complete cuts carried transversely through the stomach wall. Both types of operation are being done at the clinic under identical conditions of care and follow up. The variety of cases in general is wide, much the same as in America. For some reasons the knee cartilage cases are more frequent than in America.

At the clinic numerous special investigations are being carried on. A great deal of attention is given to x-ray studies of the gastro-intestinal tract. The wards are open to visiting surgeons and here again many valuable and ingenious devices are to be seen (special splints, frames, suction apparatus, etc.,).

In close association with the surgical clinic is the pathology department under Professor Weggelin. Here is a large collection of microscopic sections of surgical material, and here special investigations of surgical import are carried on. The Physiological Institute stands also in close association with the clinic and here under Professor Asher at all times very interesting investigations are to be seen. At both the Pathological and Physiological Departments visitors are made very welcome. Although Professor de Quervain is a very busy and hard working man he always has time for visiting surgeons and makes them very welcome. He operates six mornings a week at the Insel Hospital and also at a private hospital. He writes a great deal and is active in research and in national problems of general medical interest, serving on many committees. He is also very interested in medical school curricula and reform.

Berne is reached from Paris over night. One can take a car reservation direct through, or can go either via Basle or Geneva. From Berne are delightful week end trips into the neighboring mountains. The city itself is charming and full of points of general, historical and cultural interest. It is a splendid city of "normalcy" in an otherwise much deranged Europe and is ideal for study. From Berne to Italy is a short and direct step.

A visit to Berne will never be forgotten, both because of the great value in seeing Professor de Quervain's clinic and because of the charm of the city and country.

The Doctor's Fee.—So of doctors. They like fees no doubt,—ought to like them; yet if they are brave and well educated, the entire object of their lives is not fees. They, on the whole, desire to cure the sick; and,—if they are good doctors, and the choice were fairly put to them,—would rather cure their patient, and lose their fee, than kill him and get it. And so with all other brave and rightly trained men; their work first, their fee second—very important always, but still second; but in every nation, as I said, there are a vast class who are ill-educated, cowardly, more or less stupid. And with these people, just as certainly the fee is first, and the work second, as with the brave people the work is first and the fee second. And this is no small distinction.—John Ruskin, "The Crown of Wild Olives"—Essay on "Work," 1866. From the Bulletin of the Harvey Club, London.

Editorial

A NEW SALICYLATE

IN view of the fact that the salicylates which at present enjoy the greatest use have never proved ideal therapeutic agents, it is interesting to learn that a new chemical substance of this group has been made which offers some promise of replacing the older drugs, particularly aspirin. Ethoxymethyl salicylate, which has the formula

$$C_6H_4\ OH\ COOCH_2OC_2H_5$$

was first synthesized in 1921 by Mr. Herbert P. Foran, in the McGill Department of Chemistry. A detailed report (*) of its action in animals and man will shortly appear from the same University's Department of Pharmacology.

Compared with aspirin, the most commonly used salicylate, ethoxymethyl salicylate appears to offer two points of superiority: (1) Of the two drugs, the new one is the more soluble in water by at least five times, and (2) it exerts no discernible irritating effect upon the stomach.

The latter advantage is due to the fact that the drug is built upon the "Salol" principle, *i. e.*, a free acid radical is avoided by replacing the hydrogen of the carboxyl group by an alkyl radical. This occurs in the case of methyl salicylate, from which the new drug is in one sense derived.

Evidence of freedom from gastric irritation was obtained by feeding 9 grams of ethoxymethyl salicylate to a dog over a period of four days. Dogs similarly treated with sodium salicylate and aspirin, particularly the latter, develop erosions of the mucosa, amounting in certain parts to deep ulcers. The stomach of the ethoxymethyl salicylate dog was found to be perfectly intact.

In other respects, ethoxymethyl salicylate appears to yield results practically equivalent to those of aspirin. The following may be mentioned: (1) It is of about equal toxicity; (2) It exhibits no tendency to injure the heart or kidneys; (3) It exerts an equally good and probably more prolonged antipyretic effect; (4) It is an efficient analgesic in ordinary headaches.

(1) Toxicity studies in rats showed that the minimal lethal dose was the same as that of sodium salicylate—0.4 gram per kilo. In dogs it lies above 0.5 gram per kilo, which is sometimes a fatal dose of aspirin.

(2) Direct intravenous injection in dogs shows no untoward effect upon the heart or circulation until the fatal dose has been approximated; rabbits receiving large daily doses over a period of 20 days exhibited no indication of renal injury.

(3) As regards antipyretic efficiency, the "Coli fever" dog serves as an excellent laboratory test object. In such animals ethoxymethyl salicylate has repeatedly reduced the temperature to normal; in fact, this has been accomplished by the injection of less than 1-25th of the fatal dose. Compared with the equivalent dose of aspirin the result was more pronounced and prolonged.

(4) The analgesic effect has been tested in many cases of ordinary headache, all of the subjects reporting it to be probably of the same efficiency as aspirin.

In acute rheumatic fever, therapeutic tests of ethoxymethyl salicylate have already been made in two cases. Dr. C. Clements, of Professor Finley's staff at the Montreal General Hospital, found the usual complete relief from fever and pain within 48 hours after beginning the

*Barbour, H. G. and Foran, H. P.: *Jour of Phar. and Exper. Therap. 1922.* (In press.)

treatment. 1-gram doses were employed every two hours, reducing to every 4 hours after the third dose.

The urinary excretion of salicyl in man has been studied in two persons, who were found to retain it longer when ethoxymethyl salicylate is given than when taken in the form of aspirin.

The widespread use of drugs known to be irritating to the stomach is well appreciated by physicians. Of the ultimate consequences, in many cases, of the abuse of such irritants we are by no means fully aware. Should the new salicylate, after adequate trial under judicious supervision, prove as harmless and efficient as appears, its introduction will mark a definite advance in our therapy of rheumatic affections.

THE HABIT OF SLEEP

THEORIES as to the cause of sleep are as numerous as are the writers upon the subject but one is perhaps entitled to touch a few of the high spots in the subject and pick out some of the very obvious facts of the matter insofar as they help in the care and the control of those in whom sleep has forsaken its orderly sequence in the day's round.

Laying aside all details and such explanations as greater or less cerebral vascularity, greater or less blood pressure, greater or less dosage of fatigue products, we are compelled to recognize in civilized peoples at any rate the 'Habit of sleep'.

This habit is aided and abetted by certain recurring features of one's environment, such as darkness, cessation from toil, and the influence of suggestion which comes from within through fatigue, and from without as a result of the mass action of one's fellows, who themselves are yielding to repose.

That the habit of recurring nocturnal slumber is not as firmly fixed as some other habits, is shown by the sleeping of wild animals when fed, and their prowling when hungry, and also by the custom of aboriginal races who sleep not by the clock, but from the absence of anything better to do; and this brings up the fact that a very slight alteration in one's manner of life may break up the sleep habit of years. A night in a railway car or in an unaccustomed bed, a night in the city to the country dweller, or in the country to the city man, may break the charm and banish sleep. The nurse or the engine driver, who changes from day to night duty may have difficulty at first in getting sleep but a new habit comes in time, though rarely as firmly fixed as the old one. There are many analogies between the habit of sleep and the habit of defæcation. Each may and should become a fixture in the day's routine, and if nature's rhythmic tendency is given free course each will become a settled feature of the day. Each is largely dependent upon suggestion from within and each is equally subject to inhibition.

What preoccupation and hurry may do to destroy the normal sequence of the emptying of the bowel, anxiety and apprehension may do to tear up the track over which the sleep train passes. Simple explanation of the physiology of defæcation, and the reduction of the day's routine to a plan which allows the patient to carry this lesson into practice, is often enough to correct a long standing constipation, but how is one to exorcise the evil spirit which stands between sleep and the sleepless one? As purgatives destroy the normal impulse to evacuation of the bowel so do hypnotic drugs destroy the habit of normal sleep, and therefore when the obstacle to sleep is a mental one it is through mental rather than medicinal means that it is best approached. There may be phobia of sleeplessness which in its anxiety and apprehension, may quite destroy the normal suggestion of sleep. How may this

be attacked? At the risk of dismaying the Psycho-analysist one might use a homely illustration—A boy who has been thrashed in school may come home and kick the cat, or the man who has dropped money in playing the market may become unpleasant to his wife giving as his reason, that his coffee is cold. Now neither the dog nor the coffee was the real question at issue but the inward grievance was transferred to them, and similarly a disturbing idea lying like a sunken log under the stream of consciousness may compel the mechanism of sleep to accept substitution for it. It may take time and pains and tact to bring the sunken idea up into light and air, but this is one way to restore the 'Habit of Sleep'.

The purely physical reasons for the breaking of the normal sleep habit, such as pain, fever, cough etc., suggest their own remedy, but one must bear in mind the ease with which this normal habit may become shunted over the dependence upon the means used to quell the primary irritant, and when we realize that roughly one third of life is spent in sleep, we can see the great advantage and efficiency of having it proceed "under its own steam" rather than from the uncertain pressure of extrinsic forces.

IS A COORDINATED MEDICAL COURSE FEASIBLE? A SUGGESTION

THE present curriculum of undergraduate medical schools has developed piecemeal in the last 25 to 50 years and changes have been made to meet each advance in education as it has arisen. That a reform is needed is indicated by a perusal of the Report of the Carnegie Foundation for 1921 by H. S. Pritchett, of the Proceedings of the Congress on Medical Education in Chicago in March 1922, and of the Symposium before the Edinburgh Pathological Club in 1918. Two striking features of each of the above reports are *First*: The necessity for the abolition of the present watertight compartment system and a greater coordination between the fundamental medical sciences (Anatomy and Physiology) and the subjects taught in the clinical years (Medicine, Surgery, Obstetrics and Gynæcology, the Specialties and Pathology), and *Second:* The beginning of clinical work much earlier in the course.

From the pedagogical and psychological standpoint, educational methods in recent years are undergoing many changes. The greater the number of associated ideas a person develops about a subject, the greater the chance of the memory retaining and recalling that subject. The use of an idea with facility is the objective for which the student strives, and yet the opportunity for the medical student to use or apply his knowledge of Anatomy or Physiology and thereby acquire associated ideas, is not afforded him until one or two years after he has received instruction in these subjects. The proverbial ignorance of the medical student in the clinical years of the principles and facts of these subjects is pretty clear evidence of the lack of development of a sufficient number of such intimately related and associated ideas. In view of the above arguments, suggesting a revision of the present curriculum and with the object of providing opportunities to acquire associated ideas, an attempt has been made to see if it is feasible to draw up a course, in which the chief underlying principle is the correlation of the subjects of Anatomy, and Physiology with those of Medicine, Surgery and Pathology. Presuming that the student has completed his one or two years of premedical work and that he is required to devote his final year to purely clinical and hospital work, the course in the remaining four years might be divided on a somewhat arbitrary anatomical basis as follows:—*First Year:* Upper and Lower Extremity; *Second Year:* Thorax and Head and Neck; *Third*

Year: Abdomen and Pelvis; *Fourth Year:* Nervous System and Special Senses.

First Year: Upper and Lower Extremity. The student would first be given a general introduction to each of the main subjects, namely, Anatomy, Physiology, Pathology, Medicine and Surgery. This would be followed by the dissection, embryology and histology of the extremities and by the study of neuro-muscular physiology; in Pathology, an experimental course on inflammation and infection; a course in general Bacteriology; and the pathological histology of the tissues of the extremities. In Medicine, a general introductory course on the methods of production, recognition and prevention of disease; in Surgery, the course would cover inflammation as it manifests itself in the tissues of the extremities and the general principles of injuries to them.

Second Year: Thorax and Head and Neck. In Anatomy, dissection, histology and embryology of these parts would be covered. Circulation and respiration would form the chief basis of work in Physiology. In Biochemistry, the student would receive instruction in the chemistry of the blood and respiratory gases. The gross and microscopic pathology of the heart, lungs, breast, lip, tongue, jaws, lymphatic glands and thyroid would constitute the work. In Medicine, the physical examination and diagnosis of conditions of the heart and lungs would be dealt with. The surgical aspect of diseases of these parts would form the work in Surgery. Pharmacology would begin in this year.

Third Year: Abdomen and Pelvis. The anatomy of the various abdominal viscera would be as in the previous years. The physiology of digestion and secretion, of metabolism, of the functions of the ductless glands and of reproduction would form the curriculum and the related biochemistry and pathological chemistry would also be covered. The gross and microscopic pathology of the abdominal and pelvic viscera would be the work in this department. In Medicine, the diseases of the abdominal viscera and kidneys would form the main work, while in Surgery, the work would consist of their surgical bearing. In Obstetrics, normal pregnancy would be covered and the methods of diagnosis and treatment of lesions of pelvic organs would be begun in Gynæcology. Pharmacology would be continued in this year.

Fourth Year: Nervous System and Special Senses. In anatomy, the brain, spinal cord and organs of special sense would constitute the work, while their functions would be dealt with in Physiology. Their changes as the result of disease would form the work in Pathology; and the diagnosis and treatment would be given in Medicine and Surgery. The methods of examination of the eye, ear, nose and throat would be taught. Abnormal conditions arising during pregnancy, labour and the puerperium would be the Obstetrics. A course dealing with the problems of preventive medicine, hygiene and sanitation would be delivered.

Although the work would be mainly covered in the above described division, continuity and review could be provided by clinics on interesting cases as they occur in the wards of the hospital illustrating subjects covered in preceding years. Time-tables were prepared, in which the amount of time devoted to each subject was approximately the same as suggested by the Council on Medical Education of the American Medical Association, but space does not permit of their publication. It would appear that such a suggested course as the above is feasible and that its adoption would be an improvement on our present curriculum by providing for a greater coordination of the courses, for more opportunities to develop associated ideas, and for the student to be in attendance at the hospitals for two years longer than he does at present. It is considered that a student who had taken a course as outlined above would have a more practical and useful knowledge of both the fundamental medical sciences and the clinical subjects and in consequence would make a more efficient practitioner than one trained under the existing curriculum.

E. Stanley Ryerson

ULTRA VIOLET RADIATION IN RICKETS

WE publish in this number a report by Dr. Tisdall on the results obtained from the use of ultra violet radiation in rickets in the Hospital for Sick Children in Toronto. Huldschinsky in 1919 was the first to show that when children suffering from rickets were exposed to the rays of the mercury vapour quartz lamp the rachitic process was stopped and an orderly calcification commenced in the bony tissue. In 1921 Howland and Kramer reported investigations demonstrating that the inorganic phosphorus of the serum is markedly reduced in uncomplicated rickets. Experiments on rats showed that a diet containing an excess of calcium but a deficiency of phosphorus and lacking the anti-rachitic factor present in cod liver oil induces in the blood serum of such animals a great reduction in the normal blood content of phosphorus, a condition essentially the same as occurs in rickets in children. In an article (Amer. Jour. Diseases of Children, July, 1922) these same investigators have shown that exposure of such animals to ultra violet light, whether emanating from the mercury vapour quartz lamp, the cadmium spark, or the ferric chromium condenser spark, increases the organic phosphorus content of the blood serum, and stimulates normal calcification in a way closely similar to the action of cod liver oil. So far as could be judged by roentgenograms improvement in the process of calcification occurred in about the same period of time as it does after the administration of the oil.

Dr. Tisdall in the Toronto Hospital for Sick Children corroborates the statement that exposure to these violet rays for short periods of time causes marked increase in both the calcium and phosphorus content of the blood serum in children suffering from rickets; an increase which was followed promptly by clinical and roentgenographic evidences of improvement in the rachitic process going on in the bone.

THE WINNIPEG MEETING

THE Annual Meeting of the Association at Winnipeg June 20-23 was a distinct success from every point of view.

Under the energetic presidency of Dr. E. W. Montgomery the local committees executed their respective tasks with great credit to themselves and to the Association. Four hundred and seventy-five members registered and all scientific sessions were well attended. Concurrently with the Canadian Medical Association the Canadian Radiological Association, the Canadian Society of Anæsthetists and the Canadian Medical Protective Association also held their annual meetings.

Ample accommodation was provided in the Royal Alexandra Hotel, not only for the sessions, general and sectional but for the scientific exhibition of pathological material and apparatus and also for the commercial exhibit. It is to be regretted that in regard to the last named there was some dissatisfaction inasmuch as the space allotted was in many instances off the direct route between the registration rotunda and the assembly hall. The several sectional meeting rooms, however, were in close proximity which aided greatly the ease with which one could slip from one to the other according to the individual interest in the papers being presented.

The excellence of the papers read was fully up to the standard promised by

the titles in the programme and the discussions were prompt and not too discursive.

Professor Lewellys Barker and Professor J. M. T. Finney, both of Johns Hopkins University contributed unstintingly, and delivered papers and addresses of high scientific order.

The Friday afternoon general session, which was devoted to a symposium on Goitre, proved to be a battle royal; the discussion which ensued was illuminating and instructive. In fact the whole programme was remarkable for the predominance of papers on subjects possessing interest to all branches of the profession. Keen disappointment was felt that a number of papers had to be omitted because of the absence of the authors. In one section the session was greatly curtailed because of this. It is granted that in some cases the absence was unavoidable but in others it would appear as if the gaining of a place on the programme was not seriously considered as a contract with the members of the Association, and one to be honourably fulfilled.

On Wednesday evening a meeting open to the public was addressed by Drs. Barker and Finney who dealt in no uncertain manner with the dangers to the public of charlatanism masquerading under high sounding modern synonyms.

Living up to the traditions of the West the hospitality and entertainment were conspicuous. The City was en fete for the visit of His Excellency the Governor General, and the authorities graciously included the members of the Canadian Medical Association in the invitations to the luncheon of the Canadian Club and the reception in the Parliament Buildings. A feature much appreciated was the official Association luncheon each day. This was held in the hotel and checked any dispersion of the members thus securing a full attendance in the afternoon sessions. Garden parties, golf, and private entertainment filled every spare moment and the visitors departed feeling that interest in the Association is on the flood tide.

EDITORIAL NOTES

In this issue is to be seen a paper on the "Evolution of Surgery" as seen in the practice of one of the best known of the older surgeons of Ontario. The remarks of one who saw Lister struggling to impress upon the surgical world the great truth of asepsis and antisepsis and who has watched surgery for fifty years should not fail to interest every reader. As a detail of medical history, it is attractive to a degree and, when one is reminded that Osler's great teacher, Bovell, was one who predicted the opening of the abdomen as a matter of routine for diagnostic purposes, we also recognize him as a prophet and agree with Dr. Groves in saying that, even in those early days of Ontario medicine, there were those who dreamed dreams and saw visions.

Papers of this sort remind us that not all knowledge is gathered into the larger cities. The experiences of a practitioner of fifty years in a country district are rarely put on paper. The energy and the initiative which these details indicate make a story of themselves, and vindicate the doctor of the old school in a forcible way.

The Editorial Board of the *Journal* desire to call the attention of their readers and correspondents to the remarks of the Editor of the *British Medical Journal* on an address delivered by Dr. J. A. Simmons, editor of the *Journal of the American Medical Association*. Dr. Simmons has acted as editor of the latter journal for a period of thirty years. Under his management it has developed from a comparatively unrecognised periodical

with a small circulation into a very ably conducted journal with a circulation every week of nearly 70,000 copies, printed in Spanish as well as in English, and wielding a powerful influence for good among the profession in both North and South America.

It is the hope of the Editorial Board that this *Journal* will also some day take a high rank in medical literature. To accomplish this desire it is necessary to carry on its publication along lines very similar to those recommended by Dr. Simmons. A selection must be made of those papers which present new facts and new thoughts in a concise and clearly expressed form. In this way only shall we be able to present our readers with an interesting and readable account of the large amount of good work carried on at the bedside and in the laboratory by members of the Canadian profession, while at the same time by means of our abstracts, retrospects and editorials we endeavor to bring before the profession every important scientific advance made in medicine throughout the world.

JOHN McCRAE, M.D.—IN MEMORIAM*

IN Northern Gaul sleeps John McCrae,
A Celt united to the clay,
Of that great race; away on high
The spheres make music in the sky
As when a Cæsar had full sway.

Rare soldier bard! thy manner gay
Was wont to change to wistful lay,
When war with Hell did seek to vie,
In Northern Gaul.

Above thy cross let sunlight ray,
And song of lark, throughout the day,
Thy requeim be; let us not sigh,
Almighty God knows all who lie,
Who won or lost in dreadful fray
In Northern Gaul.

E. J. MULLALLY

*On a day in the latter part of July, 1914, at the luncheon table of the Royal Victoria Hospital, Montreal, John McCrae interested a group, among whom was the writer, by relating some of his experiences as an artillery officer in the South African war; he had arranged for transportation to Europe and was gaily reccunting some of the places he intended to visit during his forthcoming holiday. While on the ocean the Great War broke out; the harrowing experiences he went through at the front, in the early days of the Canadian participation in that momentous struggle most probably helped in lowering his resistance to the pneumonic infection which caused his death in January, 1918, when his fame as the author of the poem 'In Flanders Fields' was international. His body is buried in the cemetery in Wimereux near Boulogne in Northern France. E. J. M.

Studies in Measles.—Fresh confirmation of the artificial transmission of measles has been brought by Kawamura (*Japan Med. World*, February 15th, 1922), who has succeeded in passing the virus through monkeys for three generations. Citrated blood from a boy taken four hours after the first appearance of fever and four days before the occurrence of the eruption was injected subcutaneously into three monkeys in 1 c.cm. quantities. In each case fever commenced eight to nine days following the injection, and was followed in four days by an exanthem of roseolar, papular nature accompanied by rhinitis, conjunctivitis, and the presence of Koplik's spots. In two cases the eruption was particularly marked over the head and face, though present on the rest of the body. The duration of the fever was from six to seven days. Examination of the blood showed the appearance of a leucopenia just previous to the outbreak of the rash. Blood taken from the first monkey was injected into two normal monkeys. Each of these developed typical measles, and from one of them the disease was passed on to three more monkeys. The interest of the present observations lies in the demonstration of the infectivity of the blood in the early stage of measles, the material having been taken from the patient on the very first day of illness.—*Brit. Med. Jour.*, April 29th, 1922.

Men and Books

NOTES FROM AN EDITORIAL CHAIR

NOW and again a medical journalist is given the opportunity of setting forth some of his difficulties. Such an occasion was recently afforded to Dr. George H. Simmons, editor of the *Journal of the American Medical Association*, when he was called on to give an address as President of the Institute of Medicine of Chicago. Very wisely he selected "Medical periodical literature" as his subject, since he could speak from "an acquaintance of nearly thirty years with medical journalism." In what follows we shall endeavour to give the chief points he made, since his observations may be read with interest even by those on this side of the Atlantic who feel that their withers are unwrung. At the same time it has to be admitted that the faults on which he expatiated are not wholly unknown here.

Dr. Simmons began by mentioning incidentally that in 1848, when Oliver Wendell Holmes was chairman of a committee of the American Medical Association on medical literature, the number of medical journals published in the United States was 20, that it had risen to 230 in 1903, and that it had since declined to 120, in spite of a remarkable increase in periodicals devoted solely to scientific medicine. Moreover, Dr. Simmons notes "a distinct change in the type of papers appearing in medical journals to-day as compared with twenty years ago. The therapeutic article of the past, replete with favourite prescriptions, often proprietary in character, has given way to scientific contributions on therapeutic methods, on pharmacology, on pathology, on etiology, on methods of diagnosis, on prophylaxis." Though the number of medical journals has decreased in America, it seems doubtful whether the volume of writing for publication has undergone any diminution, for the *Journal of the American Medical Association* is now receiving between fourteen and fifteen hundred manuscripts a year, exclusive of the papers submitted to the sections of the annual meeting. Dr. Simmons estimates that three-fifths of the manuscripts voluntarily offered are returned, and the greater part of his address was concerned with the reasons for rejection.

One reason is lack of space. A fair percentage of the papers were excellent both in matter and in manner of presentation, and there could be no doubt about them. Among other papers one that is informative, that presents new facts or practical information, if fairly well written, is not returned, though it may be necessary, with the author's help or approval, to shorten or revise. In this connection the subject of length is raised; it, "like Einstein's theory as to space and time, is a matter of relativity. A paper of five hundred words may be long: one of five thousand may be short." But undue length is a common fault, and Dr. Simmons finds three chief reasons for it. The first is "rambling," due to the absence of a plan, so that the author repeats himself and goes a long way round to reach a given point. Cross-headings are recommended, not only because in a paper more than a page or so long they encourage the reader, but because the task of introducing them reveals to the author defects in the logical arrangement of his matter. Next the difficulty many experience in making a beginning is touched upon. If the way to begin a paper is not immediately obvious Dr. Simmons recommends the perplexed author to "go right to the subject without preliminaries"; to begin in the middle if necessary; when the end is reached the difficulty of the beginning will usually have disappeared. Sharpey, the father of English physiology, was at pains to impress on his pupils the importance of learning how to report their results. His first injunction was to state conclusions at the beginning; this was the old plan of the university thesis, in composing which the candidate was required to set out at the beginning the proposition he intended to prove. The influence of Sharpey's teaching is still plainly to be traced in the writings of the chief English physiologists, though some of the lesser lights tend to lapse into presenting their readers with "protocols" of experiments related in laboratory slang. Dr. Simmons would have a long article begin with "a brief digest" to encourage the reader, and end with conclusions reflecting the author's premisses and deductions to help the abstractor. We may interject here that an abstractor who works on this system will often fail to do his duty by his readers.

The second cause of undue length is verbosity—a blemish which, Dr. Simmons admits, exists in the writings of most of us. It is to be remedied by revision; during that process the writer will be astonished to find how many words, phrases, clauses, sentences, and occasionally even paragraphs can be erased without detriment to the meaning. Such deletions not only save space, but improve the style and help the reader.

The third fault enumerated is prolixity or diffuseness—the tedious discussion of non-essential details and the particularizing on trivialities. In an extreme form this fault is displayed by papers (of which it is said the American *Journal* receives specimens every week) in which the author who has a new fact or observation to make buries it in a mass of material which sometimes takes the form of a long historical introduction.

Dr. Simmons has a small opinion, as material for publication in a medical journal, of papers prepared for reading to a medical society; "as a rule, they are not so well thought out or as carefully written as are those prepared especially for printing." Some are composed to fill a vacancy, others are mere pot-boilers. Others, again, are designed to open discussions, and, while fulfilling that purpose, are not suitable for printing without drastic revision; they may be listened to out of courtesy or are carried through by the speaker's personality, but in cold type are not read. Certain societies founded recently in this country have made it a condition that the papers and discussions before them shall not be reported or printed, and from time to time older-established societies decide to put a veto on publication; this course has been taken lately by one of the sections of the Royal Society of Medicine. Were the reporting of meetings to become the exception and not the rule it would probably, by encouraging the tentative presentation of hypotheses and greater freedom of debate, be to the advantage both of medical societies and of the readers of medical journals.

The real remedy for the defects he sees—defects which, in spite of all that editorial staffs can do, continue to mar medical literature—is, in Dr. Simmons's opinion, that the art of writing should be more carefully studied and all writings submitted to thorough revision. In support of this he quotes Sir Clifford Allbutt's method as described in his book *Notes on the Composition of Scientific Papers*. That book is, or should be, too well known in this country to make it necessary for us to quote from it; we will only recall that Sir Clifford's plan is first to jot down ideas and facts on slips of paper and sort them under headings; then to make a first draft and revise it; then a second and revise it; then a third and revise it; and then to put the whole away for at least a week "in order that the final reading may be done with refreshed attention." After an inspection of some of the manuscripts in the Osler Library, which is being catalogued in Oxford before its transfer to Montreal, Dr. Simmons is able to say that Sir William Osler worked in much the same way. He was able to trace one article through its various stages: first there were notes on odd bits of paper, evidently written at odd moments; then there was a rough outline of the paper in longhand; then the first typewritten copy, with interlineations, transpositions, and deletions; next the second typewritten copy, which had been considerably modified; and finally, the third typewritten copy, which had been given to the printer. If, Dr. Simmons pertinently asks, this is the method of the masters, "what about the rest of us?" He concludes his address with an apposite quotation from Barrie: "The man of science appears to be the only man who has something to say just now, and the only man who does not know how to say it."

British Medical Journal, April 29, 1922

Abstracts from Current Literature

SURGERY

Tetanus and its Treatment. Smith, Ernest V. *Jour. Lancet*, March 15th, 1922.

From a review of the literature and an experience with 3 cases of tetanus successfully treated, it appears that tetanus antitoxin has a definite value when given intravenously in sufficient dosage. In determining the dosage, the severity of the case should be taken into consideration. For the adult and severe case, it may require from 150,000 to 200,000 units; however, many cases are reported cured with doses ranging from 60,000 to 100,000 units. The method of choice is the intravenous, and in an acute case this should always be employed. It may be advisable to give 5,000 to 10,000 units in the spinal canal at the same time the initial dose is given. The prophylactic dose of tetanus antitoxin should be at least 2,000 units. Statistics from the war go to prove beyond doubt that it is of great value in the prevention of tetanus, but the fact that tetanus did occur in a delayed type in many cases where it was used adds evidence to the belief that the prophylactic dose 1,000 to 1,500 units was not sufficient. As a prophylactic measure it should be more generally used in all lacerated and penetrating wounds, and especially in compound fractures. For this purpose it is not necessary that it be given intravenously; it may be given subcutaneously. The time should soon come when all railroad companies and employers of labour will urge its use by the physician caring for their injured. In an open discharging wound, or in a healed wound which is sore and painful, the local focus should receive treatment.

A. T. Bazin

Gas Gangrene in Civil Surgery: Report of a Case. Christopher, Frederick. *Internat. Clin.*, Series 32, 1922.

In all lacerations where there has been destruction of tissue and interference with the blood supply from injury to the vessels, and where dirt has been carried deeply into the tissues, the development of gas gangrene must be considered a potentiality. The salient factors in making an early clinical diagnosis are: History of a recent wound, swelling, increased frequency of pulse rate, tympany, crepitus, pallor of the skin, odor, ability to "milk" gas bubbles out of the wound; thin discharge, roentgenographic findings, and the maintained intelligence of the patient. Gas gangrene is associated with 3 species of micro-organisms: bacillus welchii, vibrio septicus and bacillus bellonensis (probably identical with B. œdematiens). It seems desirable that serotherapy be more generally used in the preventive treatment, which to-day consists in *débridement* of the wound, its irrigation by the Dakin-Carrel method, and delayed closure. In developed gangrene, radical removal of gangrenous parts is indicated; multiple free incisions, and Carrel-Dakin treatment Serotherapy will form an increasingly important adjunct to surgical measures as time goes on. In a case described from the service of Halstead, the patient had sustained lacerations and multiple fractures in the left hand. Tetanus antitoxin was given on admission. Gangrene appeared in the fifth digit on the third day; gas bubbles and gas bacilli, were found. The white cell count rose rapidly, (12,000-20,000) and the temperature rose to 103.4F. It was necessary to remove necrotic tissues that included the fourth and fifth digits and their metacarpals. Under the Carrel-Dakin treatment, with daily dressings, the white cell count dropped to 8,900; one week after operation, gas bacilli could no longer be found in smears. Injections of typhoid vaccine were given for a few days to see if foreign protein would augment body defence against the infection. There were severe reactions; white cells were again higher, but the general condition improved and the patient made a good recovery. Skin grafting was successfully performed at a later date.

A. T. Bazin

War Injuries Coming to Subsequent Operation. Jones, Walter M. *Ann. Surg.*, April, 1922.

The results of nerve-suture operations have shown that the suture must be end-to-end and that each severed end must show normal fasciculi. Painful neuromata have been removed from many amputation stumps. The injection of alcohol into the nerve was so painful that the practice has been discontinued. Several cases of nerves caught in scar tissues gave good results after dis-

secting them free and surrounding the trunk with fat. In the cases of loose bodies in the knee-joints, the Jones semilunar incision is the most practicable; the longitudinal splitting of the patella does not expose the region behind the crucial ligaments and the large curved transverse incision occasionally leaves a relaxed patella tendon. One traumatic knee-joint was resected because it had become the site of tuberculosis. Reconstruction of the metacarpo-phalangeal joints has been successful. During the repair of abdominal herniæ, adhesions of the bowel or omentum were found and freed. The Mayo method of overlapping has given excellent results. Muscle herniæ, probably caused by *débridement*, giving such symptoms as weakness and pain, were operated by direct suture or by fascial transplants. Many foreign bodies were removed under local anesthesia with the aid of the fluoroscope. Certain cases of skull defects in patients suffering with vertigo have been grafted. It was found that cartilage was best for this purpose since bone was generally absorbed within a few years. An attempt to drain an abscess of one year's duration was followed by meningitis and death. Bone-grafts were all autogenous. Three cases of spinal graft were successfully performed in which the spines were not split but the graft was fastened with kangaroo tendon through drill holes to the left side of the denuded spines. Stumps were revised because of spurs, neuromata, foreign bodies, ulcers, painful scars or too short skin-flaps. Scars as a rule were not disabling although several caused limitation of motion because of adherence to tendons. Amputations were performed in cases that had shown but little improvement during a period of two or three years and in which organic changes in the liver, kidney and heart seemed liable to occur. Cases of osteomyelitis have been treated in general by removing all diseased bone with mallet and chisel, swabbing with iodine and packing with gauze.

A. T. Bazin

Discussion on Postoperative Embolism and Thrombosis. Lockhart-Mummery, J. P. *Proc Roy. Soc. Med.* (Surg. Sect.), London, March, 1922.

Deaths from embolism are probably the worst tragedies of surgical practice at the present time, as not only are there no known means of preventing them, but they seem to be on the increase. Cases of embolism and infarct might be divided into 3 categories: those in which death occurs instantaneously and without any symptoms; or in a few minutes or hours following a crisis, with dyspnea and pain in the chest; and those in which the patient develops signs of consolidation of part of the lung and recovers. Stimulants should be avoided. From the evidence available it is shown that a relative degree of stasis in the veins, or at least a very sluggish venous circulation, must be present before intravascular clotting could take place, as thrombosis does not take place in children, is very rare after operations on the arms, and is most frequent after operations which predispose towards lack of movement in the trunk and lower limbs. Thrombosis in the portal vein and its tributaries is very rare, although its branches are more likely to be damaged during operations upon the abdomen than are the branches of the vena cava. The marked difference in the liability of post operative emboli between the lower part of the trunk and the upper part is explained by the fact that venous circulation in the upper part of the body is controlled by the brain and anything approaching stasis in the big venous trunks of the neck and chest is impossible. However, venous stasis is not the only cause of thrombosis as there is no evidence that mere recumbency or lack of movement would result in thrombosis, apart from operation. Embolism does not occur after rest cures, or in paralyzed persons who have lain in bed for a long time. Recently Collingwood has shown that intravascular clotting did not follow the intravenous injection of thrombin, if the blood was in a condition of circulation, although the amount of thrombin injected was actually sufficient to clot every drop in the animal's body if removed from the vessels. The conclusion was that some other factor than venous stasis must be present and this physiologists have demonstrated to be a substance called thrombokinase This substance, though not present in the blood, was found in varying quantities in all the other tissues of the body. A certain quantity was liberated whenever a wound was made, and the contact of the escaping blood with the thrombokinase present in the wound tissues determined the formation of the clot which sealed up the vessels after a cut. This substance introduced into a vein would produce intravascular clotting if the blood was stationary, but apparently failed to do so if the circulation was active. Therefore, two factors essential to the occurrence of a thrombosis are: a certain

amount of thrombokinase in the blood, and a venous stasis. It was concluded that the clot forms during or shortly after operation, that it spreads, and a portion might become detached at any time and produce an embolus, the subsequent result depending on the size of the embolus, where it started in the circulation and where it became arrested.

The only hope of the surgeon lies in preventing the occurrence of intravascular clotting after operations. The present methods of anæsthesia, with a preliminary injection of morphine, probably tend to encourage thrombosis by slowing the blood stream during the dangerous period. Formerly when patients were given gas and ether, with consequent vomiting as soon as they left the table, cases of embolism were not so frequent. Preliminary purgation of the patients should be entirely abolished, or if necessary, be carried out five or six days before operation. The practice of starving the patient before and after operation should be discontinued. A supply of proper mattresses on tops of operating tables, and prevention of patient assuming a constrained position during operation, are points requiring greater attention. The frequency of embolism after gynæcological and gall-bladder operations is possibly attributable to the unnatural positions in which the patient is placed. After operation the patient should be encouraged to move about and the large muscle masses of the legs, thighs and buttocks be kneaded in order to promote venous circulation in the cava. A T Bazin

Pain in Threatened and Real Gangrene of the Extremities: Its Relief. Bernheim, Bertram M. *Am. J. M. Sc.*, April 1922.

In gangrene of the extremities pain plays an extremely important part. It is one of the earliest signs of a failing circulation; upon its control depends the success or failure of the treatment; and it is of prognostic importance. Sedatives, except morphine in doses too large to be practicable, are of little assistance, although bromides and codein are sometimes helpful. Rest is of great importance and is hard to secure, the pain making the patient extremely restless. Therapeutic measures consist of exercises alternately to contract and dilate the larger and smaller blood vessels, which show either spastic contraction or collapse from disuse. Bernheim has his patients plunge the affected part first into a pail of iced water, and then into a pail of water almost at the boiling point, continuing these alternate plungings for five minutes, and repeating the exercise three times a day. Occasionally this treatment is too strenuous, especially when there is ulceration about the nails. Between these treatments the patient uses an electric vibrator over the entire leg and foot for five to ten minutes 4-5 times a day, the leg being rubbed with oil after each treatment. This usually relieves pain. A third measure is to occlude the blood through the affected part by means of a bandage above the knee after the leg has been elevated and all the blood expressed out of it, and after a minute or two to cut the bandage suddenly and drop the leg over the side of the bed. In the healthy leg the blood will flow to the toes in 5 to 10 seconds in the affected one 30 to 60 or even 100 seconds will be required. In addition to the above measures Bernheim gives his patients a course of Ringer's solution by means of the duodenal tube. This usually causes alleviation of the pain, though the reason for this effect is not understood. Baking has not, in his experience been successful. Ulcerations cause exquisite pain and must be treated conservatively; they heal only with improvement in the blood supply. Operative measures are often ineffective, but certain procedures may be necessary if other means fail, and the pain becomes unendurable. Ligation of the femoral vein just below Poupart's ligament has been successful, but the procedure is still in a state of trial. Amputation is the only reliable operative measure, but is sometimes contra-indicated, particularly in cases of diabetes. When diabetes does not exist the problem is less difficult. As to the point at which amputation should be done, Bernheim favours removal of the leg just above the knee, because he has found that when the attempt to save the joint is made the wound is not apt to heal. Amputation is, however, a confession of weakness. It is better to save and recreate than to destroy, and the measures which Bernheim has used have yielded good results. A. T. Bazin

Acute Hematogenous Osteomyelitis. Starr, C. L. *Arch. of Surg.*, May 1922.

Owing to the difficulty of an early diagnosis, the writer has reviewed the entire subject. Osteomyelitis is essentially an inflammation of all structures of the bone and really should be designated a periosteomyelitis. A knowledge of the anatomy is very essential. The nutrient artery enters the shaft at about its middle and divides, sending branches to either extremity,

which after numercus divisions, end in fine capillaries near the juxta-epiphyseal line or metaphysis. The epiphysis gets its blood supply from the cortical branches, which find their way in from the cortex along the epiphyseal line and are distributed to the whole of the epiphysis. The cortex of the entire shaft receives its nutrition from the periosteal vessels. Growth takes place on the diaphyseal side of the growing line. The periosteum dips into the epiphyseal line and becomes densely adherent at this point. This may prevent direct extension to the joint.

Osteomyelitis is practically always a blood borne infection from a primary focus situated elsewhere. Staphylococcus aureus and some types of streptococcus are the most common organisms found. Blood cultures are rarely obtained but when present the prognosis is extremely grave. Trauma may determine the seat of invasion. The order of frequency in which the bones are infected are, the upper end of tibia, lower end of femur, lower end of tibia and fibula, lower end of humerus, upper end of femur, lower end of radius, ulna, bones of tarsus, crest of ilium and scapula.

Osteomyelitis is extremely rare in adults. The commonest age is from two to ten years. Boys are slightly more frequently affected than girls. The earliest site of the infection is usually found in the cancellous bone near the epiphyseal line. The author found that from here the infection spreads rapidly along the line of the epiphysis, to the periosteum. Frank pus is here formed and spreads rapidly under the periosteum. The advance is less rapid towards the medullary canal, but this structure is more frequently invaded through the haversian canals, from the pericsteal infection.

Roentgen-ray findings are always negative in the early stages. The neighbouring joint is involved in only a small number of cases but may be infected secondary to operation. One may get a serous synovitis in the joint which clears up without aspiration or incision.

In the later stages we get the well known picture of the bony involucrum formed on the under surface of the periosteum, pierced by the sinuses and the gradual separation of the necrotic area or sequestrum by a layer of granulation tissue forming between the living and dead areas. The symptoms are sufficiently important to repeat Following a fall or moderate injury there is complaint of sudden and severe pain, located near a joint. Tenderness is very marked in a limited area. The pulse rate is high, 120 to 130. Temperature averages 103F There is marked leukocytosis as high as 25,000 or 30,000. The later symptoms are redness, swelling and œdema.

The treatment consists of incision over the area of greatest tenderness, through the skin, subcutaneous tissue and periosteum. Keep the incision on the diaphseal side of the epiphysis. If frank pus is encountered it is only necessary to drain for a short time. If no pus is seen, the periosteum is stripped for a short distance on either side of incision to be sure that the incision is not in the wrong place. If pus is still not obtained a series of possibly three drill holes is made from the cortex, obliquely downward toward the epiphyseal line. These are about one fourth of an inch apart at the cortex and extend into the centre of the shaft at the epiphyseal line. Within 24 hours pus is usually draining freely In no case was the medullary canal opened.

In a few cases regeneration of the necrotic area may take place without sequestration. After efficient drainage has been established, operation is delayed until the sequestrum is separated. Then a channel sufficiently large to remove the sequestrum is chiselled through the involucrum, the cavity is gently curetted until it is free of dirty granulation, sponged with iodine, and packed tightly for 48 hours with iodoform gauze after which all drains are removed. Where the cavity is large it is well to flatten the edge to allow the soft tissues to obliterate it. GEO. A. FLEET

Bone Grafts. Poate, Hugh R. G., *M. J. Australia*, Sydney, February 25th, 1922.

The best results are to be obtained by an autogenous graft composed of all layers—bone, periosteum, compact bone and endosteum—which is at once laid into the bed prepared for it, so that exact coaptation of each of these layers is obtained Next, firm fixation in this position is demanded, until such time as bony union is obtained between the graft and its bed. The better the preparation of the bed with its surrounding soft tissues and covering layers, including the skin, the more certain is the success of the graft. In Poate's experience intermedullary pegs have never been employed, owing to the many failures in their use by others In most cases a step operation or the wedging of one end of the bone stripped of periosteum into the other is the correct procedure to secure successful union. Just at much care must be taken to open up beyond the

sclerosed bone as is done in preparing a graft bed. Exclusion of the skin surface from contact with instruments which are to be used in the wound is advisable.

Before a bone graft is attempted, all "heavy" scar tissue should be excised some two or three months before the bone is touched. Even then it should be a rule never to attempt a bone graft until the wound has been completely healed for at least nine months. The presence of a sinus or any infective focus at all is a direct contra-indication. In preparing the bed it is essential to open up well through this area into healthy bone and medullary cavity, so as to reach active osteoblastic tissue. Bone which has not had sufficient inherent osteogenesis to develop union in the fractured area cannot be regarded as suitable for grafting purposes, hence the frequent failure of a sliding graft as compared to the in-lay, and the futility of using chips of such sclerosed bone to fill in any gaps or cavities. Poate does not favour the twin saw, but uses a single blade for cutting the graft and shaping the bed. A stream of saline solution must be constantly flowing on the contact point of saw and bone, so as to minimize mechanical injury and overheating of the tissues. For the same purpose a slow rate of revolution is safer than a very rapid one, and is more easily controlled. The best site for securing the graft is undoubtedly the tibia in its subcutaneous area and in its distal rather than proximal half. It is generally a mistake to include the tibial crest. Rib or the crest of the ilium is of use only in skull and jaw work. The graft must fill the bed completely, and extend well beyond sclerosed areas into healthy bone. In the radius and ulna the width of the graft should be the full width of the medullary cavity, but in large bones, such as tibia and humerus, the graft must be wide enough to be able to take a considerable amount of strain—10-15 mm. wide.

Before fixation of the graft is undertaken, it is important to see that efficient hæmostasis has been carried out. Firm fixation is one of the fundamental essentials. Most of Poate's work has been carried out with a few strands of kangaroo tendon around the whole thickness of bone and graft, and he does not rely on this to hold the graft in place for more than a few days. Wire, screws, bolts, etc., by virtue of their being foreign elements cannot but disturb the normal bone reaction; if these are necessary it is clear that exact coaptation and firm fitting between graft and bed have not been achieved in the first place. Complete immobilization of the part operated on must be secured and maintained by efficient splinting for at least ten or twelve weeks. Plaster is the best material to use, and both the joint above and the joint below should be included.

A. T. Bazin

Resection of the Small Intestine in a Case of Strangulated Inguinal Hernia. Leo, G. *Paris chir.*, January, 1922.

In a case of strangulated right inguinal hernia, in a woman of 62, a suspicious loop of small intestine was found on opening the hernial sac. The loop was resected, end-to-end anastomosis of the intestine was accomplished, and the wound finally closed without drainage. Cure remained perfect. The mesentery proved to be thrombosed. Resection in this case is believed to have been well advised, in spite of some possibility that simple reduction of the hernia might have had no ill effect. Resection is indicated if even a single point of the intestine remains discolored after application of warm saline solution, provided the anæsthesia is local or spinal, but not general. If the colour of the loop remains red, more or less dark, perhaps, but not abnormal, after applying warm saline, resection may be dispensed with. Resection is naturally less easy, and danger is greater, in proportion as the intestine is unhealthy. In doubtful cases it is best to take no chances, but resect. In this case, and in another similar to it, the patient probably owes her life to the resection.

A. T. Bazin

Drainage of the Lower Abdomen. A Simple Method. Robertson, George. *Practitioner*, London, April, 1922.

When Robertson has had to deal with a large purulent or seropurulent effusion, lying free in the general peritoneal cavity, it has been his habit to introduce a suprapubic drain after exposing the causative lesion, but previous to dealing with the visceral accident. In this way the peritoneum, mechanically traumatized by the necessary manipulations of the chief operation, has less toxic material to absorb, for much of the effusion will escape by way of the suprapubic tube, and flow over the skin surface. It is good practice, first, to expose the lesion, next, to introduce the tube, and then proceed to deal with the visceral disease. It is desirable to make the

suprapubic opening as small as possible, consistent with the use of a drainage tube of medium calibre. This little procedure is often the most unsightly part of the operation. To overcome the objections to this method, the writer uses a small "trocar guide", which is very convenient. It makes a small neat wound and is a perfect guide for the tube during introduction. A glass tube is used though a supported rubber tube might be employed. Through a tiny skin incision the "trocar guide" is directed downward and backward. Into the open end of the cylinder above the trocar point, is inserted the glass drain-tube. Two fingers carry a muslin swab of small size which is placed against the suprapubic parietal peritoneum. By pushing the glass onwards the trocar guide is sent into the gauze swab, where it becomes free and is at once extracted by way of the main wound. The glass drain-tube is thus neatly and correctly placed. It may be removed at the end of the operation or one or more hours afterwards.

A. T. Bazin

Clinical Aspects of Abdominal Tuberculosis. Morley, John. *Brit. M. J.*, London, March 11th, 1922.

The great frequency with which tuberculosis attacks the abdomen in childhood, the variations in its manifestations, and the grave results to which it leads all combine to make it a disease of importance in the abdominal surgery of the first 2 or 3 decades of life. The author states the conclusions to which experience has led him, on the subject of the appropriate surgical treatment, and cases illustrating the points are cited,

General indications for operation in the various types of abdominal tuberculosis are the following: (1) Pain, when it occurs in recurrent, well-defined, colicky attacks, especially if they return with regular periodicity and sharp intensity, signifies a mechanical interference with intestinal peristalsis; this can only be relieved by operative measures. (2) Glandular masses in the mesentery, if not too extensive, and if they do not yield rapidly to constitutional treatment, should be excised; this procedure is particularly urgent when they are associated with colicky attacks of pain. (3) Palpable masses in the ileocecal region associated with signs of chronic intestinal obstruction are an emphatic indication for laparotomy and resection of the tuberculosis ileocecal region, should such be found. (4) The ascitic form of tuberculous peritonitis, is essentially a disease for surgical treatment The operation is free from danger, and its beneficial results are usually dramatic. (5) In the plastic type of tuberculous peritonitis, if the trouble does not yield to the ordinary medical measures, operation may be undertaken with a fair degree of safety, provided that no extensive attempt is made to separate adhesions. There is some ground for hoping that even these apparently desperate cases may make a complete recovery.

A. T. Bazin

Hæmatoma and Abscess of the Anterior Abdominal Wall. Boppe. *J. de Chir.*, Paris, March, 1922.

The question must be divided according to topographic data: (1) superficial abscess and phlegmon of the subcutaneous tissue; (2) abscess and phlegmon of the sheath of the recti; (3) phlegmon of the prevesical space; (4) phlegmon of the subperitoneal cellular tissue. (1) and (4) do not require much attention, as (1) represents the common furuncles or inflammations of lymphangitic origin and the conditions in (4) are so intimately connected with peritonitis, that they must not be studied with diseases of the abdominal wall. (2) Abscesses of the sheath of the recti are consecutive to surgical interferences (septic operative inoculations); they may be very severe, phlegmonous in character; if the wall is opened a focus of suppurating myositis is disclosed. The infection may be more benign and end in a deep suppurating hæmatoma. But infections of nonoperative origin can also give rise to purulent myositis and the abscesses are, in that case, of metastatic character; typhoid infection, erysipelas, puerperal infection, gonococcic infection, staphylococcic infection are frequently responsible for the abscesses and myositis. Hæmatoma of the recti without any infective cause appears in parturient women before or after delivery, also in young, strong men, after a straining of the abdominal wall, chiefly in cavalry soldiers through an injury caused by the pommel of the saddle or in infantry soldiers, due to jumping. The hæmatoma can be caused also by a rupture of the epigastric artery; this, however, is out of the question as it is recognized and operated upon at once. Such a case of rupture of this vessel was produced in a woman, aged 53, by coughing. The hæmatoma is often caused by rupture of a small branch of the epigastric artery; these hæmatomas, whose seat is somewhat deep (behind the rectus abdominis)

heal under treatment with warm packs and bed-rest; at other times they form a cyst, or rather a hæmatic pseudocyst; but more frequently they become purulent and give the classic picture of abscess of the rectus sheath.

(3) The phlegmons of the prevesical space are of 2 varieties: (a) Phlegmons which develop in the prevesical space itself; very often these are consecutive to general infection, as typhoid fever; frequently they have a traumatic origin and are consecutive to fractures of the arch of the pubis with infection of the hæmatoma surrounding the fractured bone; and finally, they may arise after operative interference (cystotomy, suprapubic prostatectomy). In some rare cases, the osteitis of the pubis (or osteomyelitis) is responsible for these phlegmons. A typical case was observed in a boy, aged 14. (b) Phlegmons consecutive to an abdominal suppuration. The acute forms are not very interesting; they may be very limited or occupy a large area. The chronic form, ligneous phlegmon, is sometimes very difficult of diagnosis, because the original abdominal disease has not been recognized. They are characterized by a thick mass of sclerous and fatty tissue, which invades the muscles and transforms them into a lardaceous, nearly cartilaginous tissue. After cutting through this anomalous tissue, we find one or more central, very small abscesses, containing a teaspoonful of creamy pus and very often a foreign body which gave rise to the suppuration. These foreign bodies may be of surgical origin (silk, catgut), or of intestinal origin (tape-worms, pin-worms, biliary calculi). In some cases, peritoneal adhesions consecutive to an appendicitis explain the formation of the abscesses. There are also cases in which the invasion has occurred by lymphatic or arterial channels. The differential diagnosis of these ligneous phlegmons of the anterior abdominal wall is sometimes very difficult. The surgeon may hesitate between an encysted hæmatoma, and a tumour (fibroma). The diagnosis from the cysts of the urachus (when these are suppurating) is quite impossible. A common error is to take such phlegmons for malignant tumours of the wall (sarcoma or metastasis from a visceral cancer). This error has serious consequences, as the surgeon dares not operate in the opinion that he has to deal with a cancer, and operation is the sole rational treatment of these phlegmons. Finally, these phlegmons have been mistaken for deep visceral tumours (ovarian cyst, fibroma, cyst of the liver) and the error in diagnosis has been corrected only at operation.

A. T. Bazin

MEDICINE

Pernicious Anæmia. Christian, Henry A. *Internat. Clin.* 1: 8, Series 32, 1922.

The author regards pernicious anæmia not as a blood disease in itself but as a general disease in which the blood and blood forming organs are involved. In cases studied carefully the lesions are not confined to the blood and blood forming organs. Cases occur in which the nervous system is extensively involved while the anæmia is as yet slight. Gastro intestinal symptoms are practically always present and usually precede the anæmia. The presence of anæmia should be regarded as more significant than any single characteristic of the blood. Extensive central nervous lesions with even slight anæmia are symptoms of special importance from a diagnostic standpoint. The best method of treatment up to the present would seem to be transfusion. Evidence of the transfused corpuscles may be found as long afterward as 100 days, and in some instances transfusion seems to start a new activity in blood formation. A final analysis, however, does not prove that the life of transfused patients is greatly prolonged, and up to the present no method has been devised that can be considered as a definite cure. A. H. MacCordick

Whooping Cough and the Value of Vaccines. Hull, Thos. G. *Illinois Health News.* February, 1922.

Whooping cough is a disease which has merited serious consideration since the 16th century To it are attributed each year a relatively high number of deaths. That the causative factor is the bacillus as described in 1906 by Bordet and Gengou seems now fairly definitely established. United States Public Health statistics show that 94.5 per cent of deaths occur in children under 5 years of age, while 57 per cent of all children affected are under 1 year of age. The disease is most readily communicated during the first two weeks, just at a time when the diagnosis is most difficult. A reliable immunizing vaccine would be of great benefit especially in institutions. The efficiency of vaccines obtainable at present is somewhat doubtful. It has been established, however, that 25 to 30 per cent of all children are naturally immune, and

moreover that three weekly doses of fresh vaccine will produce a positive complement fixation in 94 per cent. of the cases vaccinated. The benefit derived from the administration of vaccine after the disease is established is on the whole questionable. A. H. MacCordick

The Nature of the So-called "Capillary Pulse". Boas, E. P. *Arch. Int. Med.* June 15th, 1922.

The "capillary pulse" has been of interest to clinicians ever since Quincke first called attention to it in 1868 The phenomenon has been attributed to a pulsation of the capillaries

The writer, employing the technique described by Danzer and Hooker, studied a series of cases which exhibited clinical capillary pulse. The details are well set forth, and are of interest.

He concludes that the so-called "capillary pulse" is not a manifestation of a pulsation of the capillaries, but is due to an exaggerated pulsation of the arterioles and possibly of the venules of the sub-papillary plexus of the skin.

F. R. Brown

DERMATOLOGY

Scleroderma Following Nerve Injury. *Arch. of Derm. and Syph.* May, 1922.

This is the report of a case where a blocking of the inferior dental nerve for tooth extraction was followed in three weeks by the development of a patch of scleroderma corresponding very closely to the original area of anæsthesia. It began as a small depigmented spot opposite the extracted tooth, and this quickly spread and developed the typical characters of scleroderma. X-rays of the mandible showed unexplained areas of rarefaction in this region.

In the microscopical examination the point most dwelt on was the apparent absence of nerve fibres, and the case is used as a text to advance the idea that there is a neurological factor underlying this condition. But in the discussion, due consideration is paid to the part played coincidently or otherwise by infection and also by the endocrine system. H. E. MacDermott

Non-Specific Protein Therapy. Ahlswede, Edw. *Arch. of Derm. and Syph.* May, 1922.

A thorough discussion of such a subject is impossible in so brief an article, but a clear idea is given of the rationale underlying this therapy as at present understood. A rather large field is included in the number of acute and chronic inflammatory conditions which may be improved by this treatment.

The protein used is milk albumin, germ and toxin free. Ten c.c.m. are injected intramuscularly at intervals of three or four days till the reaction is complete. H. E. MacDermott

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BACKWARD CHILDREN.—Backward children are not always, perhaps not often, backward because of either mental deficiency or slothfulness, says the U. S. Public Health Service. Many of them are backward solely because of such ordinary and easily remediable defects as adenoids, near-sightedness, or bad teeth.

A case in point was recently reported by the official representative of the Public Health Service in the eighth sanitary district of Vermont, in which the Service is co-operating in a rural health work project.

Medical inspection of one of the graded schools in October, 1919, showed that it had been thought necessary to instruct in a special room sixteen pupils who had seemed to be unable to keep up with their respective classes. Physical examination showed that each of the sixteen had some serious hampering physical defect (chiefly enlarged tonsils, adenoids, or defective hearing or eye-sight) which, rather than any mental handicap was the probable cause of their inability.

Through the co-operation of the school directors, the facts were brought to the attention of the parents or guardians of the children and all were set right before the end of the year.

On re-examination of the pupils the next December (1920) it appeared that all of the sixteen previously backward children had caught up with their proper grades and were keeping up in them with their classmates. A year later, in December, 1921, some of these sixteen children were among the mental and physical leaders in their grades.

News Items

NOVA SCOTIA

THE clinical activities of the various health centres in Halifax, and some of the field activities of the Massachusetts-Halifax Health Commission as summarized by the Chief Nurse for June, show a total of 599 medical and nursing consultations.

In summarizing the field work, this report sets forth that public health nurses from the Health Centres of Halifax and Dartmouth during June, made a total of 2,793 visits in a total of 1,954 homes, in these communities and adjacent thereto. In addition, the visiting housekeeper made 128 instructional visits into 32 families where nutrition problems were paramount. 1091 families are receiving medical and nursing guidance from all clinics; 821 families are receiving nursing advice in their homes, making a total of 1,912 families receiving health advice from the nurses.

The Preschool Dental Clinic reported a total of 63 consultations, at which 324 operations were performed, and 570 treatments given, and a total of 84 extractions under gas anæsthesia.

Several addresses were given by the staff of Health Centre No. 2 and by the Executive Officer and Tuberculosis Examiner, at the opening of the new Health Centre branch at Turft's Cove on the 24th.

QUEBEC

A SHORT series of informal clinics on the medical and surgical diseases of children including orthopædics will be given by the staff of the Children's Memorial Hospital in Montreal during the last week in August. They will begin on Monday, August 28th, and will occupy the morning hours until Friday, September 1st. The afternoons will thus be available for visiting places of interest about Montreal. As the number of physicians, who can be accommodated in the Hospital is limited, those desirous of availing themselves of these clinics, are requested to communicate with either of the undersigned at the Children's Memorial Hospital, Cedar Avenue, Montreal.—A. MACKENZIE FORBES, M.D., C.M.; H. B. CUSHING, B.A., M.D.

ONTARIO

ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION

Committee on General Purposes.—The Committee on General Purposes met at University College, Toronto, on Tuesday, May 30th, 1922, at 11.10 a.m, with the Vice-President, Dr. E. R. Secord, in the chair. After welcoming the delegates, the president instructed the secretary to call the roll to which 71 responded. The minutes of the previous meeting were taken as read. Carried.

The following communications were then dealt with:

Re Fee Splitting.—Moved by Dr. Mullin, seconded by Dr. McDonald, that this matter be referred for action to the incoming directors. Carried.

Re Canadian College of Physicians and Surgeons.—Dr. Anderson—"We should move slowly in a matter of this character." It was moved by Dr. Mullin, seconded by Dr. Morgan, that the communication be referred to delegates of the Canadian Medical Association to be reported upon in the afternoon. Carried.

Re Invitation for Next Annual Meeting.—Moved by Dr. McDonald, seconded by Dr. Cody that the invitation from Essex County Medical Society for the next Annual Meeting be referred to the nominating Committee. Carried.

Re Definition of Practice of Medicine.—Moved by Dr. Anderson, seconded by Dr. Daley that the communication from Western Ontario Academy of Medicine re the definition of the practice of medicine, etc. be referred to the Joint Advisory Committee. Carried.

Re Workmen's Compensation Board.—Moved by Dr. Mullin, seconded by Dr. McDonald that the communication from the Kingston and Frontenac Medical Society re the Workmen's Compensation Board be referred to the Committee appointed to deal with those matters. Carried.

Re Applications for Affiliation.—Moved by Dr. Mullin, seconded by Dr. Wishart that the applications for affiliation from five county societies, namely, Victoria, Sault Ste. Marie, Stormont and Glengarry, Renfrew and Haldimand, and also the letter defining the limits of jurisdiction of the Hamilton Medical Society and the County of Wentworth be referred to the committee named for that purpose by the Chair. Carried. The following Committee was named to deal with the matter: Drs. Argue, Anderson and Brandon. Moved by Dr. Mullin, seconded by Dr. Argue that the meeting go into a Committee of the whole to discuss the directors' report. Carried. The Chair named Dr. Robt. T. Noble as Chairman of the Committee of the Whole. On motion of Dr. Henderson, seconded by Dr. Farley, it was resolved that the Directors' Report be received and discussed clause by clause. The Secretary then presented the clauses *seriatim*.

Re Semi-Annual Business Meeting.—Moved by Dr. Mullin, seconded by Dr. Farley that the question of the semi-annual business meeting be referred to the directors with the recommendation that such a meeting become a regular feature of the Association, and that the committee on general purposes be empowered to transact all business

at the semi-annual business meeting without reference to a business session of the Association, upon the business receiving a two-thirds majority vote of the members of the committee on general purposes present and voting. The motion, on being put to a vote, was declared lost. It was decided that the matter of the income tax be again referred to the Canadian Medical Association. Upon completion of the consideration of the report of the directors, Dr. Secord moved its adoption. Dr. Noble, in quitting the Chair of the committee of the whole, moved the adoption of the report of the committee of the whole. Carried.

The report of the Treasurer as printed having been presented, it was moved by Dr. G. Stewart Cameron, seconded by Dr. M. H. V. Cameron, that the report be received and adopted. Carried. The question of office quarters was referred to the incoming Board of Directors. In addition to the report presented, the Treasurer gave a complete resumé of the administration of the "Red Cross Fund", showing that, out of the $5,000.00 received, $3,506.52 had been disbursed up to the present time. The Treasurer also presented the budget for the balance of 1922, which showed a minimum estimated expenditure of $6,000.00 for the balance of the year from a present credit balance of $7,504.91.

The Committee on Affiliations approved of the action of the Board of Directors and recommended the complete affiliation of the following societies: Stormont and Glengarry, Haldimand, Sault Ste. Marie, Renfrew and Victoria. The Committee further approved the resolution of the members of the medical profession in the county of Wentworth and the city of Hamilton providing for the inclusion of the county of Wentworth within the limits of jurisdiction of the Hamilton Medical Society, and recommended that the Hamilton Medical Society be the affiliated county society for the county of Wentworth and the city of Hamilton.

The report of the Editorial Board was received and adopted.

The report of the Committee on Mental Hygiene was presented and adopted.

The report of Committee on Inter-Relations of the Medical Profession and the Public was presented, and the discussion held over until after the round table dinner. Reports were presented on hospital standardization, on ethics, on public health.

The report of the Committee on Necrology was received and adopted by a standing vote.

Reports of the Programme Committee; and the Committee on Arrangements were then presented and adopted.

In connection with the report of the Committee on Tariff it was agreed that each practitioner in the province be supplied with that section of the tariff applicable to his practice.

The Report of the Advisory Committee to the Board of License Commissioners was adopted. In speaking to this report Dr. Routley advised, "That the committee on general purposes carefully consider the pros and cons of the reappointment of this committee with due regard to the danger involved in splitting the ranks of the Association." Dr. Ferguson endorsed Dr. Routley's remarks, but thought there was no need of the Association being split on the matter.

Dr. Daley asked, "Did the committee give a ruling on the number of 50 (maximum prescriptions)?" Dr. Routley replied, "No." Dr. Mullin considered that county societies should have an appointee to work along with the advisory committee. This was carried. It was then moved by Dr. Farley and seconded by Dr. Mullin, that the appointment of an advisory committee to the board of license commissioners be recommended. This was carried.

The Report of the Workmen's Compensation Board Committee was presented and adopted. The following points were noted in the discussion:

Dr. Argue—"The Ontario Medical Association should repudiate the present workmen's compensation tariff."

Dr. Wilson—"Protests in many ways should be carried on by an active committee."

Dr. McDonald—"Our newly adopted tariff should be sent on to the workmen's compensation board."

Dr. Ferguson—"The Committee is doing good work."

Dr. Cruikshank—"The Ontario Medical Association should discuss this matter with the College of Physicians andSurgeons, and, in this and every other particular, work with the College of Physicians and Surgeons at every opportunity."

Dr. Mullin—"Has the College of Physicians and Surgeons power to say that the fees of the Workmen's Compensation Board are adequate?"

Dr. Argue—"Workmen's Compensation fees are better than nothing."

Dr. King—"The "College" is responsible for the present workmen's compensation tariff."

Dr. Routley—"Would suggest the appointment of a joint committee of the Ontario Medical Association and the "College" to deal with the Workmen's Compensation Board."

Dr. Tovell—"An x-ray man should be on any such committee which meets with the Workmen's Compensation Board."

Dr. Daley—"Many plants name their own doctors and list them on signs in the shops."

Dr. King—"The act says that the employer shall provide medical attendance, which will no doubt justify the action pointed out by Dr. Daley." The discussion having been concluded, the adoption of the report was declared carried.

The Report of the Committee on Pharmacy was presented by Dr. Henderson and adopted.

Report of the C. M. A. Delegates re Canadian College of Physicians and Surgeons was read by Dr. Marlow. In outlining the project he stated that the formation of such a College had in view many advantages to the profession, particularly the ear-marking of qualifications of Canadians by Canadians. Queen's University endorses the plan; the Western University does not at the present time endorse the plan; the University of Toronto considers the project a very large one, but will lend its support if the C. M. A. decides to go on with it. Several men, in rising to speak on the question, pointed out the following: that the committee should present more detail as to the aims and objects of the "College"; that the Association should not commit itself to an unknown quantity; that the matter is too complicated to be given our unqualified approval; that, although we favour post-graduate work, it is not certain that the plans being outlined are feasible for this country. It was finally moved by Dr. Marlow, seconded by Dr. Argue, that the O. M. A. endorse the proposal to establish a "Canadian College of Physicians and Surgeons" for the purpose of promoting post-graduate work and its recognition by diploma. Carried.

The following was then declared the Committee on Nominations: Dr. Farley, Dr. Mullin, Hamilton; Dr. F. W. Hughes, Weston; Dr. H. R. Hamilton, Lambton; Dr. Colbeck, Niagara District; Dr. Scott, York; Dr. Keith, Sault Ste. Marie; Dr. Daley, Hastings; Dr. Watt, Brantford; Dr. McLay, Oxford; Dr. Boyd, Victoria; Dr. Moore, Perth; Dr. Harris, Dr. King, Dr. Marlow, Dr. Cleland, Academy of Medicine, Toronto; Dr. Cruickshank, Essex; Dr. Argue, Ottawa; Dr. Wood, Peterboro; Dr. Lewis, Simcoe. It was decided that the nominating committee should meet immediately following the business session of the Association on Wednesday morning, *re* Sault Ste. Marie letter. Moved by Dr. Elliott, seconded by Dr. Routley, that the Sault Ste. Marie medical society be advised that there is no objection to the resolutions as drafted being placed before their members for their guidance. It was pointed out, however, that it was not within the province of the O. M. A. or a constituent society to prevent the coroner issuing a certificate, as he must in all cases be guided by the circumstances. The motion, on being put to a vote, was declared carried.

After discussion it was moved by Dr. Elliott, seconded by Dr. Marlow, that the Kingston and Frontenac Medical Society be advised that the Workmen's Compensation Board are within their rights in having a representative visit and report upon a patient without reference to the

attending physician or surgeon; (the question is not one of medical ethics), and that the report be received and adopted. Carried.

The Report of Committee on Education was presented by Dr Mullin, and adopted. Before the motion was put, several speakers spoke very warmly of the work that had been carried on by the Committee on Education.

Re the Red Cross Grant.—Moved by Dr. Mullin, seconded by Dr. Farley, that the incoming Board of Directors be instructed to endorse acceptance of the Red Cross Grant for another year, and that the Ontario division of the Red Cross be so advised. Carried.

The Report of the Committee on Venereal Disease was presented by Dr. Routley, seconded by Dr. Argue, and adopted. Carried.

It was moved by Dr. Wilson, seconded by Dr. Henderson, that the incoming Board of Directors be instructed to appoint a committee to inquire into the modern methods of industrial medicine and to act in conjunction with the provincial department of public health. Carried. The meeting adjourned at 5.45 p.m., to be followed at 6.30 p. m. by the Round Table Dinner. The Committee on General Purposes reconvened at 10.30 p. m. following the round table discussion, which discussion had been largely centred upon the report of the committee on inter-relations. It was then moved by Dr. Young, seconded by Dr. Cameron, that the report of the Committee on Inter-relations be received and adopted. Carried.

The degree of doctor of medicine was granted to eighteen candidates at the convocation exercises of Western University, London on May 26th. Dr. Joshua Hugh Lewis was the winner of the J. B. Campbell Memorial Scholarship in Medicine. Of the graduating class of eighteen, seventeen took the licensing examination of the College of Physicians and Surgeons of Ontario and sixteen were successful; one member of the class took the examination of the Dominion Medical Council and was successful.

BRITISH COLUMBIA

THE Annual Meeting of the British Columbia Medical Association, District No. 4, was held in Kelowna on June 8th. There was a large attendance of doctors from Kamloops, Vernon, Summerland, Penticton and Kelowna. The retiring President, Dr. W. J. Knox, gave an address in which he reviewed the year's work and what his hopes were for the future of the organization. There was a general discussion of many subjects, in which every doctor present took part, and the meeting was in every way a great success. The next meeting is to be held at Kamloops on October 4th. The following officers were elected for the coming year: President.—Dr. Osborne Morris; Vice-President.—Dr. J. S. Burris, Kamloops; Secretary-Treasurer.—Dr. W. Arbuckle, Vernon; Representative to Executive of British Columbia Medical Association.—Dr. H. H. Murphy, Kamloops; Delegates to August Meeting of British Columbia Medical Association.—Dr. F. W. Andrews, Summerland, Dr. H. M. McGregor, Penticton.

THE British Columbia Medical Association is nearing the end of its membership campaign. A recent tour of the Executive Secretary through the Okanagan and Kootenay Districts in addition to coast cities in the north, *viz.* Powell River, Ocean Falls, Prince Rupert and Anyox, resulted in 100 per cent. of the profession joining the Association. There is now no question as to the opinion of the medical men in this Province in regard to the necessity of united action in the various much needed reforms which are at present receiving the earnest consideration of the Executive and Committees.

The Annual meeting of the British Columbia Medical Association will be held during the week ending August 26th. The Monday, Wednesday and Thursday evenings of that week have been allotted to the Association by the Vancouver Medical Society, which is holding its Summer School during that week.

Dr. M. T. MacEachern, Surveyor of the Victorian Order of Nurses for Canada, and who is on leave for one year from his duties as General Superintendent of the Vancouver General Hospital, paid a short visit to the city recently, on which occasion he participated in the graduation exercises of the nurses' training school, when the class, numbering 66, a record, received their diplomas.

Dr. D. J. Barclay has been appointed Medical Officer of Health for Kaslo, B. C.

Dr. A. S. Monro has been elected first Vice-President of the Pacific North West Surgical Society.

GENERAL

REPORT OF FIFTEENTH ANNUAL MEETING OF THE AMERICAN AND CANADIAN SECTIONS OF THE INTERNATIONAL ASSOCIATION OF MEDICAL MUSEUMS

A MOST successful meeting of this Association was held at the Army Medical Museum, Washington, D.C., on Monday, May 1st, 1922. A large attendance was present, including representatives of the medical service of the American and Canadian Governments. In his opening remarks, the Chairman, Dr. James Ewing of Cornell University, emphasized the growing importance of the Association because of its devotion to the interests of the science of Morphology, which must ever remain the fundamental branch of medicine. An excellent programme, dealing principally with museum technique and morphological pathology, was presented and thoroughly discussed.

Bulletin VIII, *Journal of Technical Methods and* Bulletin IX, the *Sir William Osler Memorial Bulletin'* were ordered published and will be distributed in the near future. Upon recommendation of the Council, the Exchange Bureau and Bureau for the preservation of the results of medical research of this section of the International Association of Medical Museums was transferred from the McGill University Medical Museum to the United States Army Medical Museum in Washington, D.C.

The following officers were elected for the ensuing year: President.—F. B. Mallory, Boston; 1st Vice-President.—H. T. Karsner, Cleveland; 2nd Vice-President.—H. Marshall, Virginia; 3rd Vice-President.—R. A. Lambert, Yale. Councillors: A. S. Warthin, Ann Arbor, Mich.; James Ewing, New York; W. T. Coplin, Philadelphia; William Boyd, Winnipeg; H. E. Robertson, Mayo Clinic, Rochester; Major G. R. Callender, Washington, D.C.; Major James F. Coupal, Washington,

D.C.; H. S. Haythorne, Pittsburgh, Pa.; Carl V. Weller Ann Arbor, Mich.; Stuart Graves, Louisville, Ky.; L. J. Rhea, Montreal. Secretary-Treasurer.—Dr. Maude E. Abbott, McGill University, Montreal. Assistant Secretaries.—Dr. Harold Segall, Montreal, Dr. W. W. Beattie, Montreal.

At the close of the scientific programme the meeting adjourned to inspect the large recent accessions to the Army Medical Museum and a series of special exhibits from members of the American Association of Pathologists and Bacteriologists and its conjoint Societies, the International Congress of Opthalmologists, the Canadian Army Medical Museum, and the Pathological Museums of Pittsburgh and McGill Universities, which had been set up in the spacious halls of the Army Medical Museum under the ægis of the International Association of Medical Museums.

Obituary

DR. M. I. MCLEAN

Dr. M. I. McLean, Mayor of North Sydney died suddenly on June 27th while preparing to go out on his professional duties. He graduated at Dalhousie College, and shortly after graduation took a post graduate course in London University. A few years ago he spent another six months studying in the surgical wards of Johns Hopkins Hospital, and also in the hospitals of Philadelphia and New York. Dr. McLean was regarded by his confreres as an able and conscientious surgeon ever considerate of the best interests of his patients. His genial personality and unvarying kindness endeared him alike to patients and confreres.

Book Reviews

The Mechanics of the Digestive Tract by Walter C. Alvarez M D., Assistant Professor of Research Medicine, University of California, 8vo, pages xii, 192 with 22 illustrations. New York, 1922, Paul B. Hoeber. Price, $3.50.

In this little book of 183 pages, Dr. Alvarez has enlarged and elaborated the material of a lecture given by him before the meeting of the American Roentgen Society in 1920, in which the observed phenomena of peristalsis were discussed from the standpoint of rhythmicity, irritability and latent period. The writer has undertaken to make the book sufficiently readable and practical to be of use to the physician looking for help in the problems of practice, while embodying sufficient technical detail for the research student who is interested in the physiology of digestion. A chapter on technique and a complete bibliography are added for the use of the latter class.

Starting from the observation that different parts of the gastro-intestinal tube manifest differences in irritability, and noting as is well established that rhythmic contractions can be induced in the excised stomach or bowel, the writer proceeds to establish the autonomy of myenteric action and to investigate the existence of a pace maker for contraction waves and the presence of gradients of irritability which determine the direction of the resulting peristalsis.

In the rabbit the gradient of rhythmicity is shown in that the duodenum contracts at about twenty to the minute while the lower ileum contracts at ten, and it can be shown that the rate varies inversely with the distance from the pylorus. The basis of this gradient must be the physiological activity of the tissue, and the author and his collaborators have demonstrated a gradient of metabolism in CO_2 production and also in the catalase content of the muscle, while measurement of electrical activity supports this view; other related gradients which run parallel are those of latent period, tonicity and irritability.

The observed facts of these gradients find a practical application in the study of the passage of food through the tract and in the effect of mechanical factors such as diseased conditions and alterations produced by operative interference; diarrhœa may be caused by irritation in the gastro-duodenal area, causing a heightened gradient at this end, while appendicitis or obstruction in the lower end of the ileum by raising the otherwise lower level, cause delay and even reverse waves with vomiting. Gradients in the large bowel are hard to demonstrate. Generally speaking, tone is higher in the rectum and sigmoid than in the cæcum and ascending colon, thus preventing the bowel contents from packing into the lower part too quickly, and the author's observation is that all cases of constipation are spastic, with stagnation in the rectum and tightened sphincters.

Reversed peristalsis with regurgitation and vomiting, the vomiting of pregnancy and that associated with lesions in the lower abdomen and pelvis, and the fact that substances introduced *per* rectum may be tasted or even vomited, are studied from the standpoint of gradients in the tract and an interesting explanation given.

On the whole, the book is most refreshing and stimulating to thought and serves to give a rational basis for the study of many phenomena which have puzzled the internist. The writer frankly separates what is well supported from what is conjectural, and further work will be awaited with keen interest. A. J. M.

Aids to Organotherapy. Ivo Geikie Cobb, pages viii+ 183, price 5s. Bailliere, Tindall and Cox, London, 1922.

This neat, well printed book is a compilation, not very critical nor accurate in character. The author seems entirely ignorant, for example, of the epoch-making work of Kendall, and of the Mayo school, on the thyroid, its active principles, its physiology and pathology. While the book contains many interesting facts, it contains such inaccuracies as, for example, that on page 12, where in the first paragraph, pituitary is said to act on the sympathetic, not on the parasympathetic, while in line 29 it is stated to act on the autonomic (or parasympathetic). On page 36 he refers to "polypharmacy, which is mercifully now a thing of bygone days," yet he devotes several labored pages to a justification of polyglandular therapeutics. Both polypharmacy and polyglandular therapeutics are due to the same cause, inaccurate or incomplete knowledge or thinking lacking in clarity. A member of the profession who wishes to be convinced of the advantages of organotherapy will find this book a useful aid.

V. E. H.

Transactions of the American Surgical Association. Volume the thirty-ninth. Edited by John H. Jopson, M.D., Recorder for the Association. Containing the papers read before the Association at the meeting held June 14th, 15th and 16th, 1921. Pp. 779, with numerous illustrations.

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Disappearance of Malaria in Denmark.—The issue of *Nature* for March 9th, the appearance of which was delayed owing, as we are informed, to labour troubles, contains an interesting note on a paper on Danish mosquitos by Dr. C. Wesenberg-Lund, who has made a long and very careful research into the biology of mosquitos in Denmark. In dealing with the three species of anopheles—*A. plumbeus*, *bifurcatus*, and *maculipennis*—found in Denmark, particular attention is given to the biology of *A. maculipennis*, which is regarded as the chief carrier of malaria in Europe. The author states that in Denmark this species sucks blood from domestic animals, pigs, cattle, and horses, that it is seldom seen in the open, but is found, often in incredible numbers, hanging, sluggish and blood-filled, from ceilings of pigsties, cowsheds, and stables. Only exceptionally does it suck the blood of man, whereas in Mediterranean countries it is an outdoor species feeding largely on human blood. He considers that in Denmark *A. maculipannis*, which is there living near the northern limit of the range of the species, has ceased to be an outdoor species sucking the has ceased to be an outdoor species sucking th blood of man, and has taken to an indoor life and restricted its attacks to farm animals. This change in habits has, he thinks, been the main factor in the disappearance of malaria, the last great epidemic of which took place in Denmark in 1831. The change in the habits of the mosquito followed, he says, an alteration in agricultural methods about a hundred years ago. Whereas, previously the swine had been driven to the woods to feed on mast, they and other farm animals were thereafter housed, and the stables form so many traps which attract mosquitos by the odour and heat of the animals within; once within the stable the mosquitos find all they need until the time arrives for pairing and egg-laying. Thus the connection between man and *A. maculipannis* has been broken in Denmark, and malaria was, therefore, bound to disappear. The author remarks that, if the measurements of the length of this mosquito given by Meigen (1818), when the species presumably fed in the open and largely on man, are correct, there has been an increase in size during the intervening century, in spite of the fact that in Denmark the species is living near the northern limit of its range.—*The British Medical Journal*, March 25th, 1922.

Etiology and Prognosis of Serous Pleurisy in Children.—Neuland (*Klinische Wochenschrift*, March 4th, 1922) mentions the opinions of various authors who estimate that in so-called idiopathic serous pleurisy in the adult more than half of the patients, sooner or later, and mostly within the first five years, suffer from tuberculosis of the lungs. These authors regard a serous pleurisy of the adult, which neither by the history nor by clinical examination can be attributed to any primary disease, as a tuberculous pleurisy. From his observation on 45 cases Neuland attempts to decide (1) if serous pleurisy of unknown etiology is also tuberculous in children; (2) if tuberculosis of the lungs follows a serous pleurisy in children so frequently as in adults. As regards the first question, Neuland found that 10 out of the 45 cases examined failed to give the cutaneous tuberculin reaction. He concludes that we cannot regard all cases of serous pleurisy, of unknown origin, in children as tuberculous, and that serous pleurisy in children is not so frequently tuberculous as in the adult. Moreover, whilst not denying the close relation between serous pleurisy and tuberculosis, Neuland thinks we are not justified even in concluding that all cases giving a positive cutaneous tuberculin reaction are tuberculous. As regards the second question, the subsequent development of tuberculous lung disease, he was able to obtain information in 29 cases. Of these 29 cases, 24 had given at first a positive Pirquet tuberculin reaction, 5 had been negative. At the end of periods varying from one to ten years, 23 of the 29 cases were in good health, and of these 18 had given at first a positive Pirquet reaction. Of the 6 whose health had failed 3 had suffered from pulmonary tuberculosis, 1 from tuberculous caries of the spine, and in 2 cases the condition of the lungs was indefinite, but probably tuberculous. In the 5 cases in which at first the Pirquet reaction had been negative, examination at a later period failed to reveal any signs of tuberculosis. Neuland concludes that in children the prognosis, as regards subsequent tuberculosis, is much better than in adults.

"As for fame and popular applause, they are lighter than a feather, or a bubble, and more vain than the shadow of a dream."—Medical Lectures and Aphorisms—P. 314—1915—Gee. S.—(Ex. Bulletin of Harvey Club, London).